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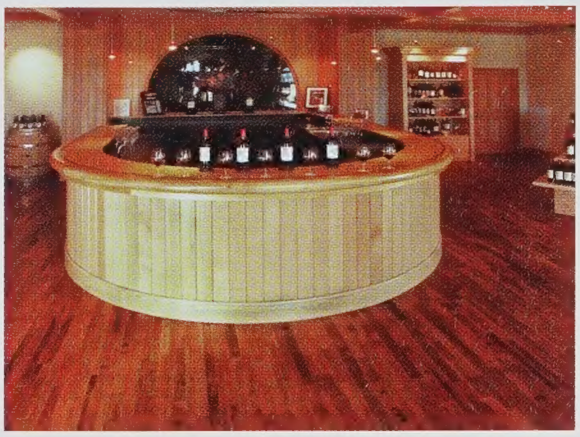

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Progress toward reduced-risk pest management

BY Jennifer Campos,
and Minghua Zhang
Dept. of Land, Air, and
Water Resources,
University of California, Davis

Concerns about pesticides in the environment and their potential effects on human health have fueled increased regulation of their use in agriculture. The Food Quality Protection Act (FQPA) of 1996 is one such regulation. This act fundamentally changed how the U.S. Environmental Protection Agency (EPA) regulates pesticides.

Previously, pesticide tolerances were based on the toxicity of each individual pesticide considered in isolation. With the enactment of the FQPA, tolerances are determined not by individual pesticide toxicity, but by calculating cumulative toxicities of pesticide residues (along with other contaminants) in foods. As a result of this new legislation, many pesticides are being re-examined, with the possibility they might be restricted or removed from use in agriculture.

Fortunately, winegrape growers have already demonstrated their ability to adapt to a changing regulatory arena. As the FQPA enters its eighth year, this report will examine its dramatic impact on pesticide use. We will also review the latest trends in reduced-risk pest management in California winegrapes.[1]

Winegrape growing counties analyzed in this study include Madera in the southern San Joaquin Valley, and Napa and Sonoma counties in the North Coast region. Pesticide use trends (particularly FQPA pesticide use; see below) within each county are examined for the years 1993 to 2001. County averages of pesticide use are baselines to compare variation within counties.

In this study, FQPA pesticides refer to EPA-designated priority I and priority II pesticides, whose active ingredients have higher toxicities and are most at risk for restriction or elimination under FQPA. Many priority III FQPA pesticides are classified as reduced risk or biopesticides and therefore are considered separately. There are approximately 86 priority I and II FQPA pesticides and 47 priority III FQPA pesticides that are used on winegrapes and are under review.

Pesticide Use Reports (PUR) are the main data source for this report. PUR data contain records of pesticide use for every commodity, grower, and pesticide application going back to the early 1990s. In the PUR data, every grower or operator is assigned a unique identification number that is associated with each reported application. These data are submitted monthly to local agricultural commissioners, who then report the data to the Department of Pesticide Regulation.[4]

A productive use of PUR data is to identify conventional growers who apply fewer pesticides than average, particularly pesticides being reviewed under the FQPA. The cultural and biological practices of these low-use growers can then be investigated to provide information on regionally specific, reduced-risk pest management strategies. The success of these grower pest management models can then be shared with other growers in the region to promote alternatives to some of the most toxic pesticides.

Measures of pounds of active ingredient (AI) are used in this analysis. To facilitate trend analysis, AIs are grouped into four pesticide classes: fumigants, fungicides, herbicides, and insecticides (the latter includes miticides unless otherwise noted). While grouping allows data summation and interpretation, it should be noted that this is an aggregation of pesticides that vary in recommended label rates. Use intensity refers to pounds of chemical per acre planted. Pounds of chemical per acre treated refers to the use or label rate.

Pesticide use trends

From 1993 to 2001, total pounds of pesticide applied on winegrapes decreased by 33% in Madera County,

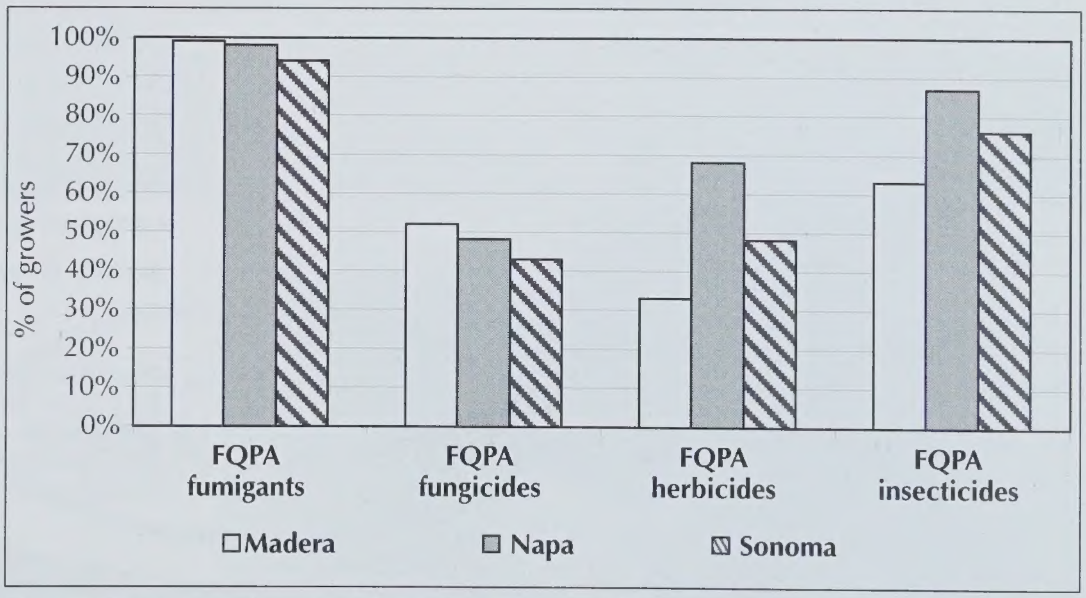

Figure I. Percentage of growers in Madera, Napa, and Sonoma counties that did not use FQPA fumigants, fungicides, herbicides, and insecticides in the year 2000.

Table I. Winegrape acres planted and percent change of acres planted from 1993 and 2001 in Madera, Napa, and Sonoma counties

	acres planted 1993	acres planted 2001	percent change 1993–2001
Madera	48,357	58,828	22%
Napa	44,308	48,487	9%
Sonoma	40,778	60,179	48%

46% in Napa County, and 41% in Sonoma County. During the same period, winegrape acreage increased by 22%, 9%, and 48%, in the three counties, respectively (see Table I). Consequently, reductions in use intensity were more signficant, decreasing by 45%, 51%, and 53%, respectively. A significant decline in sulfur use over the years contributes to this overall decline.

In analyzing use by pesticide category among winegrape growers from 1993 to 2000, greater reductions in FQPA fumigant and insecticide use were observed than for FQPA fungicide and herbicide use. Sulfur is not under FQPA review and is therefore not included in the totals for FPQA fungicides.

Results from the year 2000 show that in all three counties, only 6% of growers used FQPA fumigants (Figure I). Similarly, only 37%, 23%, and 24% of growers in Madera, Napa, and Sonoma counties used FQPA insecticides in 2000.

In contrast, reliance on FQPA herbicides and fungicides was more widespread among growers in all three counties for the year 2000. This result indicates a need for more effective reduced-risk herbicide and fungicide options and/or increased extension and education about reduced-risk practices.

FQPA fungicides were used by 48%, 52%, and 57% of growers in Madera, Napa, and Sonoma counties, while 67%, 32%, and 52% of growers used FQPA herbicides in 2000. FQPA herbicides, such as oxyfluorfen (Goal®) and simazine (Princep®), and FQPA fungicides, such as mancozeb (Dithane®) and myclobutanil (Rally®), remain popular options among winegrape growers.

Reduced-risk pesticide use trends

The EPA classifies a pesticide as "reduced-risk" if it has a low impact on human health, low toxicity to non-target organisms (birds, fish, and plants), low potential for groundwater contamination, lower use rate than conventional pesticides, low pest-resistance potential, and compatibility with integrated pest management (IPM).[6] Given the evidence that use of FQPA fungicides and herbicides is still important for many winegrape growers, a review of the reduced-risk pesticide alternatives is warranted.

Reduced-risk fungicide use has increased among growers in the counties studied. The EPA classified, reduced-risk

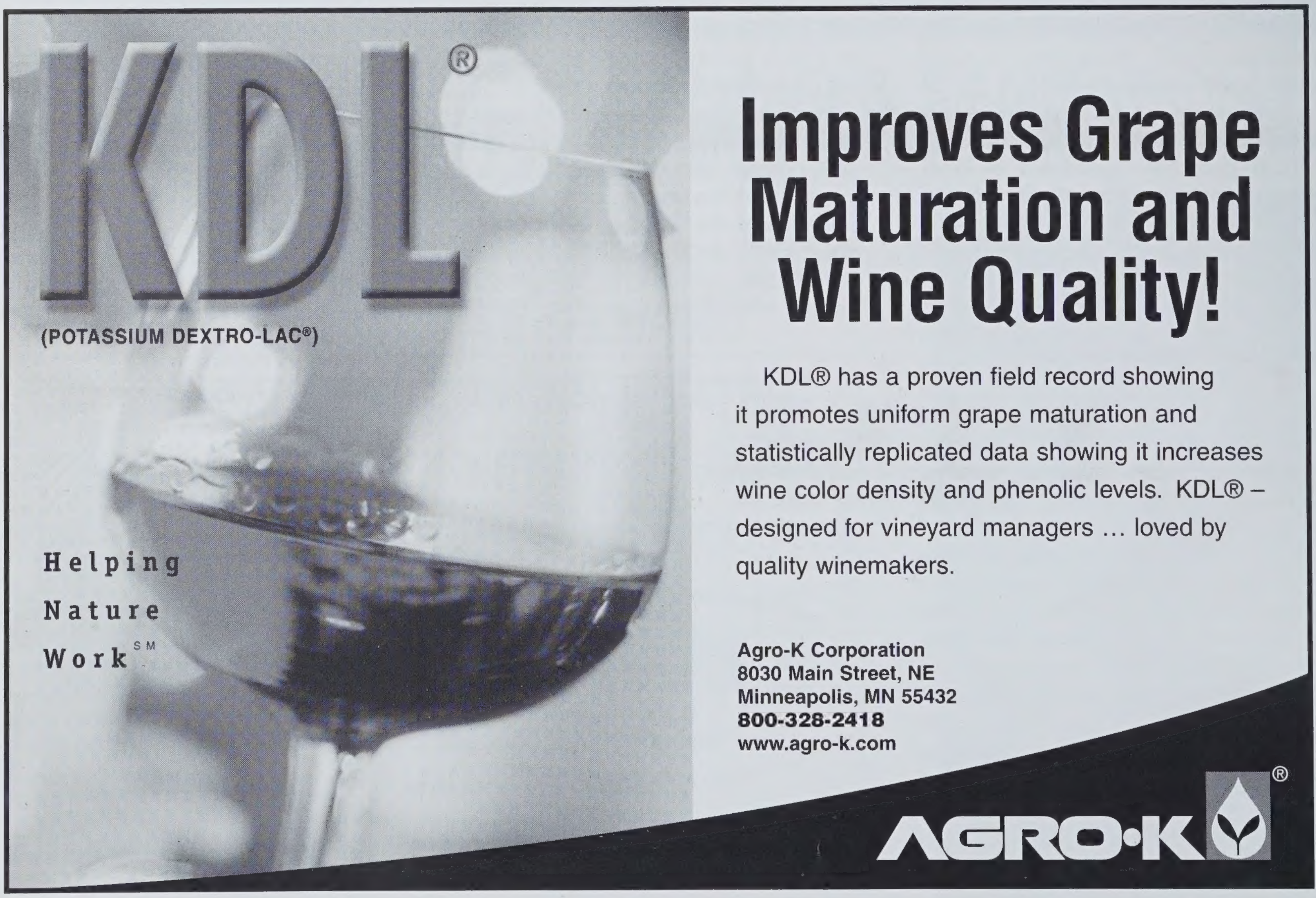
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Table II. Average FQPA pounds per acre planted from 1993 through 2001, % of growers using very low rates of FQPA pesticides, % of growers using very high rates of FQPA pesticides, and percent change of growers using very low and very high rates of FQPA pesticides from 1993 to 2001

County	Average FQPA pesticide use in lbs/acre planted (1993–2001)	% of growers using very low rates of FQPA pesticides*			% of growers using very high rates of FQPA pesticides**		
		1993	2001	% change	1993	2001	% change
Madera	2.56	44	58	32	26	3	–90
Napa	1.46	74	93	21	9	<1	–80
Sonoma	8.8	57	8	–58***	10	2	–80

*very low equals 0-25% of county average lbs/acre planted of FQPA pesticide use

**very high equals over 100% of county average lbs/acre planted of FQPA pesticide use

***Sonoma County numbers skewed by methyl bromide use before 1999.

fungicides used in winegrapes include: azoxystrobin (Abound®), cyprodinil (Vanguard®), fenhexamid (Teldor®), potassium bicarbonate, QST 713 strain of *Bacillus subtilis* (Serenade®), and trifloxystrobin (Flint®, Stratego®).

Azoxystrobin first appeared in the PUR database in all three counties in 1997. By the year 2000, 8%, 10%, and 15% of growers in Madera, Napa, and Sonoma counties, respectively, reported using it.

Potassium bicarbonate first appeared in the PUR in 1998. Its use as a reduced-risk fungicide for powdery mildew (*Uncinula necator*) has risen sharply in Napa and Sonoma counties, while its use in Madera has steadily decreased since 1998. Napa and Sonoma counties observed 417% and 472% increases in potassium bicarbonate use from 1998 to 2001, while use in Madera County decreased by 88% over the same time period.

Decreased use in Madera County could be due to the fact that sulfur is very effective in the southern San Joaquin Valley compared to the more humid North Coast region. Potassium bicarbonate has activity against existing infections only and has little residual activity against new mildew infections.

The OST 713 strain of dried *Bacillus subtilis* (Serenade®) mixed with horticultural oil has been used successfully in Sonoma County to combat powdery mildew. Success with this mixture offers an alternative to FQPA fungicide applications and allows reduced sulfur applications.

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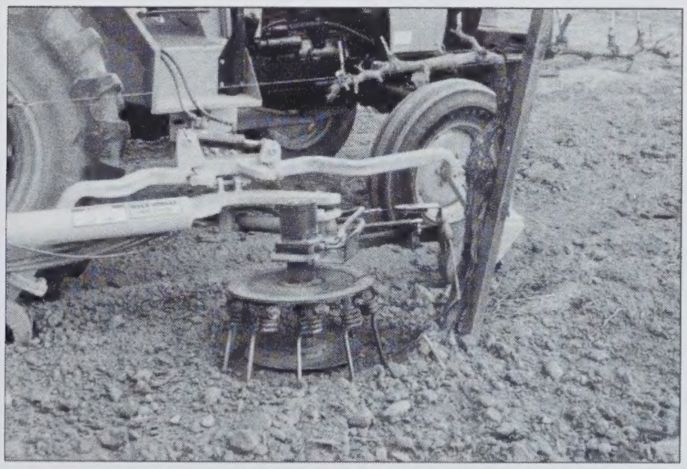

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herbicide. In the year 2000, this post-emergence herbicide was applied to 71%, 75%, and 84% of acres in Madera, Napa, and Sonoma counties. While its use remains popular among winegrape growers, pre-emergence herbicides are also widely used.

Current efforts to reduce herbicide use are focused on reducing the amount used and/or narrowing the treated area under vines. In Napa and Sonoma counties, respective 21% and 10% reductions in FQPA herbicide use intensity were observed from 1993 through 2000.

In Madera County, however, a 3% increase was observed for the same period. Economics is key to understanding the adoption or non-adoption of reduced-risk pesticides. Depending on growers' profit margins, it may not be feasible to use reduced-risk herbicides because of increased cost associated with repeated post-emergence herbicide applications. The allure of pre-emergence herbicide is that only one spray is needed pre-season, reducing overall labor and fuel costs.

Pesticide use variation

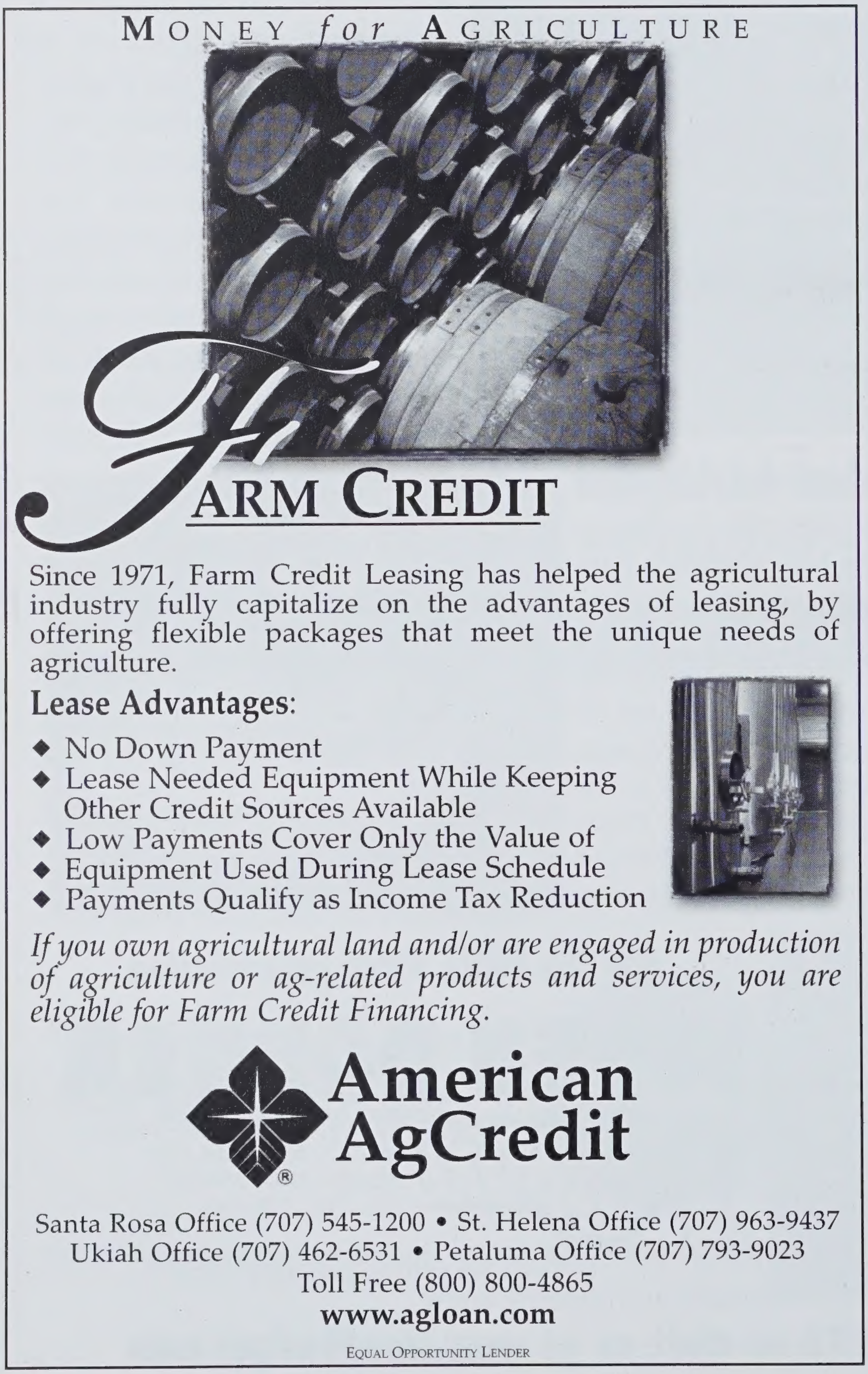
Although widespread pesticide use reduction has been documented (particularly for FQPA pesticides), there is still significant variability among growers for use intensity and rate. Some growers apply little pesticide, implementing such practices as increased mechanical tillage for weed control, use of electrostatic sprayers and other equipment to limit application rates, or reliance on biological or other cultural practices.

Innovations of low-use and low-risk winegrape growing should continue to be shared among local growers, as case studies and/or personal experiences of successful pest management practices provide relevant information for growers in similar ecological conditions.

An analysis of FQPA pesticide use from 1993 to 2001 found that overall, the number of growers using very low rates (0 to 25% of county average) of FQPA pesticides increased over the years, while the number of growers using very high rates (more than 100% of county average) decreased (Table II).

The results for Sonoma County are skewed by a high average resulting from high rates of methyl bromide use prior to 1999. Methyl bromide is typically applied when new fields are planted, however efforts to reduce methyl bromide use in Sonoma County resulted in a 93% decrease in use from 1999 to 2001, with an 8% increase in winegrape acres planted in the same period, indicating that alternatives to methyl bromide were used.

Growers who are above the county average in use intensities represent a target population for continued education and extension programs that pro-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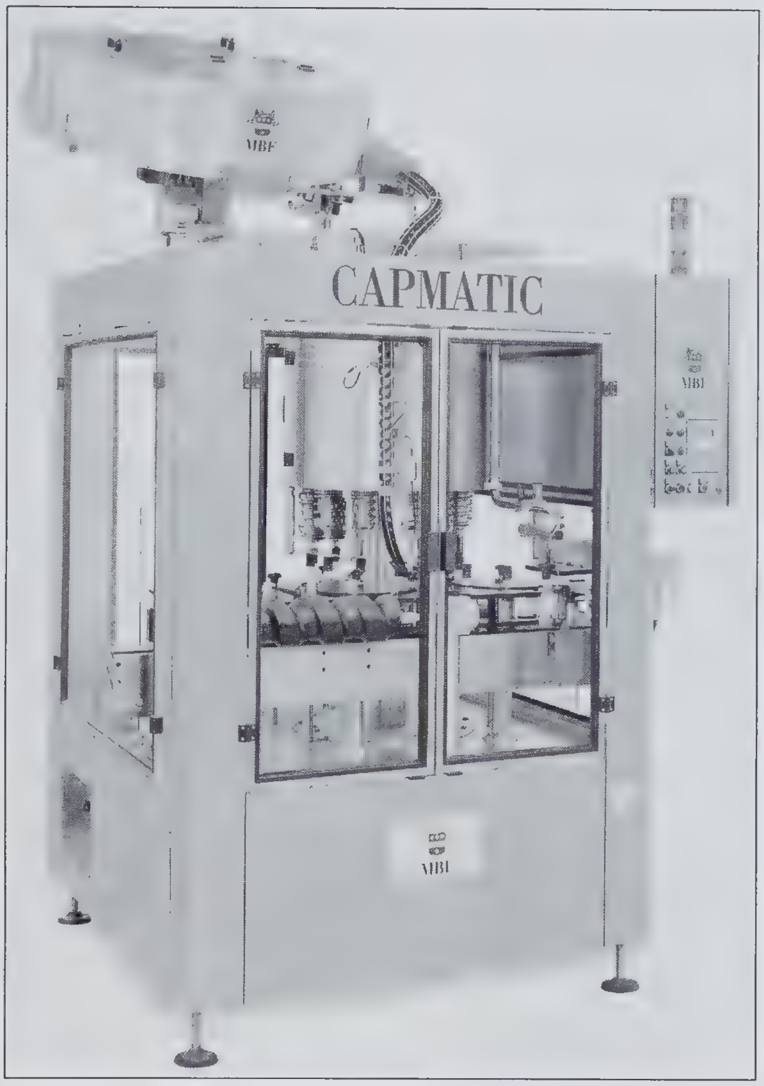

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mote alternatives to FQPA and other higher risk pesticides.

Why have reductions occurred?

The trends in winegrape pesticide use in Madera, Napa, and Sonoma counties demonstrate decreased dependence on pesticides under FQPA review. Interpreting the data and understanding the factors that contribute to pesticide use reduction are essential for effective promotion of reduced-risk farming practices.

Factors that may have affected pesticide-use trends in California winegrapes over the last decade include regulatory pressure, grower innovation, grower and community concerns about human health and environmental effects, economics, and winery and consumer influences, among others.

Regulatory pressure clearly can have an effect on pesticide use, particularly regulation like the FQPA, which has the potential to remove or restrict pesticides from agricultural use. Such regulation prompts growers to innovate and experiment with alternative products or practices in anticipation of loss of pesticide options.

Concerns among growers and the general population over the health and safety aspects of pesticides contribute to reduced use. Growers seek to reduce the use of those pesticides with undesirable environmental or safety profiles. Vineyard neighbors increasingly voice complaints about pesticide drift and odors from sprays and sulfur dust.

Winegrape organizations have been major players in providing grower education about reduced-risk pest management. Examples of local demonstration and outreach programs include: California Association of Winegrape Growers Pest Management Alliance, Lodi-Woodbridge Winegrape Commission, Central Coast Vineyard Team, Napa Sustainable Winegrowers Group; and Sonoma County Grape Growers Association. These programs incorporate direct involvement with growers, emphasizing farmer-to-farmer information exchange.

Grower innovation

Models of collaborative research and education have become widely recognized for their ability to utilize practical experience of growers in improving farming practices. Growers are intimately familiar with their farming systems and are able to assess factors affecting production to respond to complex, dynamic, and unpredictable conditions.[3]

Agro-ecological understanding obtained from real experience over time allows growers to develop approaches suited to their particular climatic, soil, and pest situations. Their accomplishments are the result of practical experimentation.[5] Those who learn to decrease reliance on chemicals do so through knowledge of local ecological processes.[1]

Winegrape commodity groups, such as those mentioned above, have applied these principles to promote reduced-risk pest management in winegrapes. The effect of these programs in pesticide-use reduction and innovation should not be underestimated.

Napa County innovation

Jason Kesner, vineyard manager at Hudson Vineyards in the Carneros region of Napa County, is a member of the Napa Sustainable Winegrowers Group. He is implementing a plan to farm in a more sustainable fashion, specifically by transitioning away from pre-emergence herbicides to a more integrated approach to manage weeds. The 185 acres of vines, 163 of which are bearing, are planted to Chardonnay, Syrah, Merlot, Cabernet Franc, and Pinot Noir.

Kesner is replacing pre-emergent herbicides at Hudson Vineyard with a combination of mechanical weed control and glyphosate application, depending on the individual block and field conditions. Cover crops are seeded to reduce the area requiring weed control, and bandwidths of herbicide applications have been reduced.

However, cover crops can attract gophers and other rodents. In response, Kesner has had owl boxes installed to provide an effective predator for rodents, and trapping has replaced baiting.

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Kesner's approach to vineyard pest management is flexible, relying on multiple approaches throughout the vineyard. Much depends on the lessons learned each year, such as which blocks are amenable to mechanical weed control, and a constantly evolving knowledge of individual blocks and field conditions, such as soil type, water-holding capacity, and pest pressure relative to specific grape variety.

A Clemens weed blade and hoe plow are used for mechanical weed control. The crew had problems in the past with inadvertent vine removal in older trellising and in blocks with tight vine spacing.

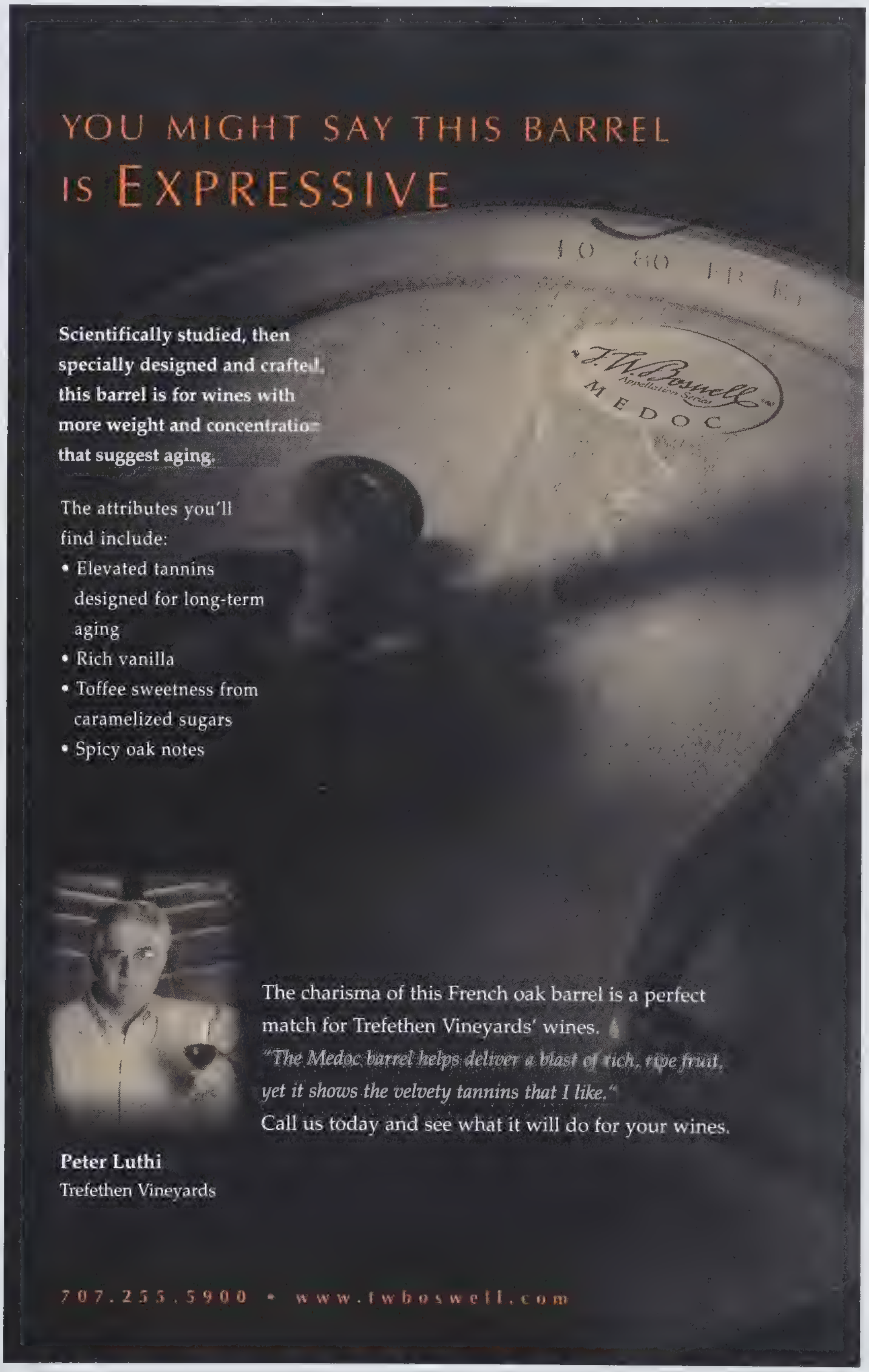
Kesner's observations of variable weed and pest pressures throughout the vineyard have resulted in a customized and flexible vineyard management approach. In blocks with low weed pressure, he often is successful with one application of glyphosate per year in the late winter or early spring, or only mechanical weed removal. In other fields with more weed pressure or in years with late rains, he applies two sprays, or he uses a combination of mechanical weed control and glyphosate application.

The insecticide program at Hudson Vineyard has relied on imidacloprid because of its selective pest toxicity. Applications of Provado (imidacloprid) at ½- to ¾-ounce per acre were foliar-applied early in 2003 in blocks with high thrip populations. This decision was based both on thrip counts, and the fact that a cold wet spring would compound the potential damage inflicted by the high populations. In years with rapid bud break and early shoot growth, those applications probably would not have been made.

The approach to leafhopper management has been one of increased tolerance. The blocks of Merlot and Syrah that mature later are affected by additional leafhopper lifecycles and increased leafhopper populations. In these blocks, Kesner has been successful with a late-season (September) imidacloprid application. No application was required in other fields with earlier harvest.

Kesner's decision on whether to spray for leafhoppers late in the season also depends on whether populations are so high that they would cause significant irritation to workers at harvest. (He often determines this simply by walking through the vineyard and shaking the vines to see if there are, in fact, enough to bother the pickers.) A harvest coinciding with high leafhopper populations can result in leafhoppers getting into the eyes and even the air passages of workers.

"Due to potential resistance issues, we don't want to ultimately rely solely on imidacloprid," explains Kesner. "We are exploring other options, such as timing of mowing of cover crops for thrips, dialing in vine vigor for leafhoppers, and working to sustain beneficial predator populations for both."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Reflecting on pest management at Hudson Vineyards, he continues: "We began our effort to reduce pesticide use in 2000 and 2001. In 2000, 100% of our blocks were strip-sprayed with pre-emergent herbicide. In 2001, it was 98%, 2002, 49%, and in 2003, only 8%. Our goal for 2004 is 0%, though new plantings remain a challenge. We try to avoid shovel work, and new plantings can pose a problem.

"The transition has been a continual learning process. For example, 2003 was not the best year to rely so heavily on mechanical weed control, given all of the late spring rains. It seemed as if we were growing weeds until August. I also think that, as the previous years of pre-emergent applications wear off, we will see and are seeing changes in the types and amounts of weeds we do have, and so new challenges will emerge.

"I don't plan on resting on glyphosate for the ultimate answer, and will continue to experiment and attempt to find better approaches to our overall goal of sustainability. We will, in all likelihood, be looking in the direction of mulching as one of those approaches.

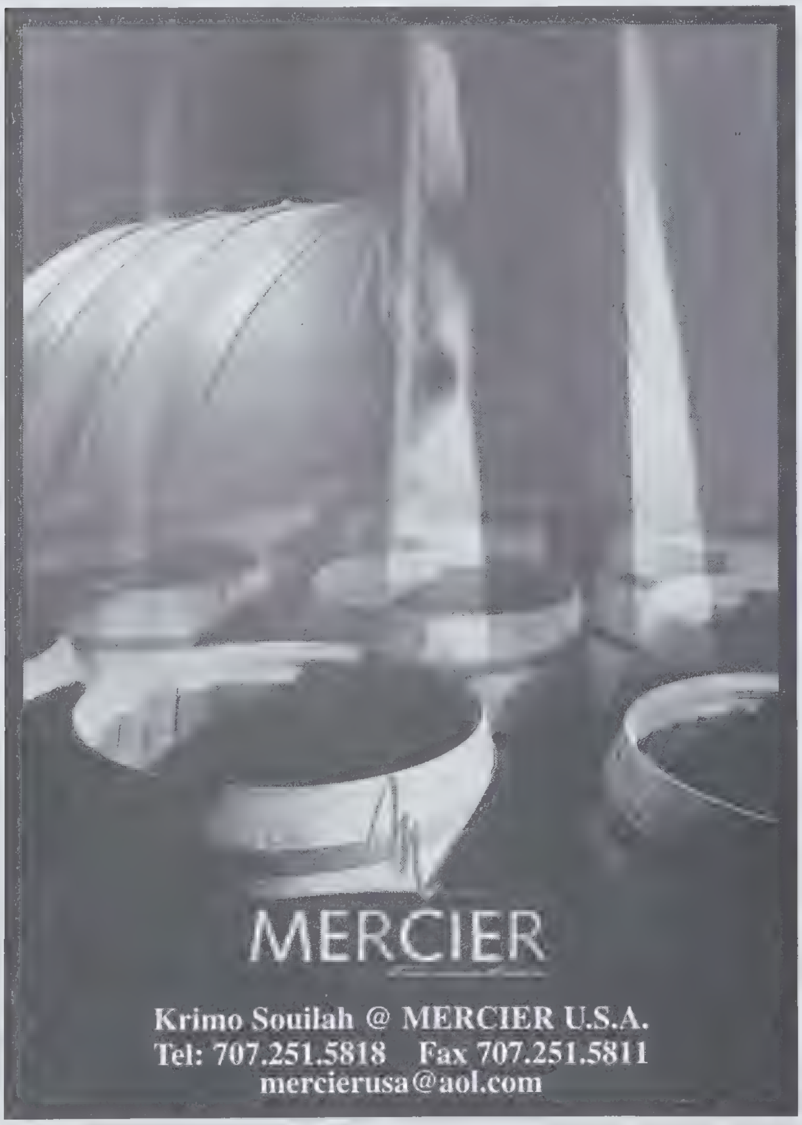
"It has not been an easy transition, but it is simply the way we need to manage the vineyard in the future, and we will ultimately find the best and hopefully most sustainable way to do that via continued trial and error. While these efforts have increased our costs, they have also increased our confidence that we are doing better for the environment and our workers."

Madera County innovations

Jon Holmquist, agronomist and area manager for the Canandaigua Wine Co., has been a vocal leader and participant in CAWG's Pest Management Alliance (PMA) and Sustainable Winegrowing Project. He has hosted field days at Canandaigua's Paul Masson Vineyard near the town of Madera, where he has demonstrated and discussed approaches for managing weeds, other pests, and sulfur.

Canandaigua has 425 participating acres managed by Holmquist in the PMA project. For weeds, a Donnovator in-row cultivator is supplemented with conservative use of post-emergence herbicides (such as Roundup® at one quart per acre). The use of cover crops and drip irrigation allows tillage in the participating vineyards to be kept to a minimum, reducing the high cost associated with tractor operation.

An entomologist by training, education, and vocation for 15 years, Holmquist understands that reduced mechanical tillage will reduce dust in the vineyard, which could exacerbate mite problems. Field monitoring and trapping (carefully monitoring activities of growth and development of pest organisms or other factors on a regular basis; with use of colored sticky traps or other types of traps used to facilitate monitoring) are conducted so that miticides are used only when it is documented that an economic threshold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(pest density at which controls must be applied to avert economic loss) is reached.[7] Trapping is for lepidopterous insects, primarily omnivorous leafrollers, not mites. Trapping gives Holmquist a biofix for spray timing.

Holmquist promotes the use of cover crops primarily to improve soil health and tilth, which tends to improve vine health. His cover crop mix includes barley, bean, vetch, and pea with exact proportions, depending on goals for vine vigor.

Owl and bat boxes are placed in the vineyard to enhance predation of vertebrate pests and omnivorous leafrollers (OLR). Holmquist has observed gopher bones in owl pellets under owl boxes. Further, he hopes that an increase in the number of bats will suppress OLR populations, (insectivorous bats and OLR are both night fliers).

Holmquist stresses that reduced-risk practices must be economically viable, particularly in Madera County, where profit margins are low compared to the North Coast. In 2002, Chardonnay grapes from Napa County sold for an average of $2,316 per ton. The same variety from the Madera area sold for $201 per ton, according to the 2002 California Agricultural Statistics Service Grape Crush Report.

Dan McCarty, independent winegrape pest control advisor (PCA) in Madera County, suggests the best thing a grower can do to reduce pesticide use is to plant cover crops in vineyards. He urges growers to plant and maintain cover crops throughout the growing season to promote insectaries of beneficial insects, such as spiders, lacewings, and parasitoids.

McCarty contends that if a cover crop can be maintained throughout the growing season in Madera County, some growers may not need to spray for leafhoppers or mites, and he sometimes sees an effect on omnivorous leaf roller (OLR) and grape leaf skeletonizer (GLS) populations.

To augment natural populations of beneficial arthropods, many growers release lacewing eggs into the cover crop for increased leafhopper control. This is typically at the end of February, but is timed with observations of aphid populations that will help sustain beneficial lacewings.

The biggest challenge is for growers to maintain cover crops in a drip-irrigated vineyard. A drip line can be installed in the middle of the tractor row where cover crops are planted. Growers can seed cover crop every row, alternating rows, or even every 10th or 20th row. This adds an expense, but McCarty believes the benefits outweigh the costs for Madera growers.

The typical cover crop program in Madera is a six-foot wide band of field pea, vetch, bell bean, and barley in a 12-foot wide tractor row. McCarty says that some growers he works with let the vetch go to seed. Vetch reseeds well, so some growers will go four to five years without

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Table III. FQPA pesticides targeted for reduction in Sonoma County

Insecticides
Dimethoate
Diazinon
Fenamiphos (Nemacur®)
Carbaryl (Sevin®)
Fungicides
Mancozeb (Dithane®)
Iprodione (Rovral®)
Miticide
Propargite (Omite®)
Herbicides
Simazine (Princep®)
Oxyflurofen (Goal®)

reseeding, reducing costs. Many fields are still flood-irrigated in Madera, making season-long cover cropping easy.

However, McCarty recognizes that one potential drawback of cover cropping is that vineyard temperatures can be lower in cover-cropped vineyards compared with non-cover-cropped vineyards, an important distinction if there is a threat of frost damage. At the first sign of an upcoming frost, growers should mow the cover crop and start sprinkler irrigation to increase the temperature and minimize or avoid frost damage.

McCarty confesses that some areas of Madera County have inherently low pest pressure. For instance, some areas around natural waterways support native berries, which serve as insectaries for the parasitic wasp, *Anagrus epos*, an egg parasite of grape leafhopper. Some growers have encouraged these natural enemies by planting blackberries and French prune trees, another *Anagrus* host.

Sonoma County innovations

The Sonoma County Grape Growers Association (SCGGA) began an integrated pest management (IPM) program in 2000 to provide a network for growers to exchange information on IPM and pest control practices.[2]

Four demonstration vineyards were established, one each in the Russian River Valley, Dry Creek Valley, Alexander Valley, and Sonoma Valley. Participating vineyard managers were committed to IPM and environmentally sound farming practices. A pest control advisor (PCA) monitored the four demonstration vineyards weekly from bud break through veraison, and all pest and predator counts or ratings were entered into a database.

Monthly grower meetings were held in each vineyard from April through July. Pest and predator populations were reviewed, and the PCA and vineyard manager discussed pest management decisions. Alternatives to pesticides listed under Proposition 65 and, beginning in 2001, under FQPA review, were discussed.

Grower participation increased from 60 in year-2000 to nearly 100 growers who attended the monthly meetings in 2002 and 2003. Peer education proved

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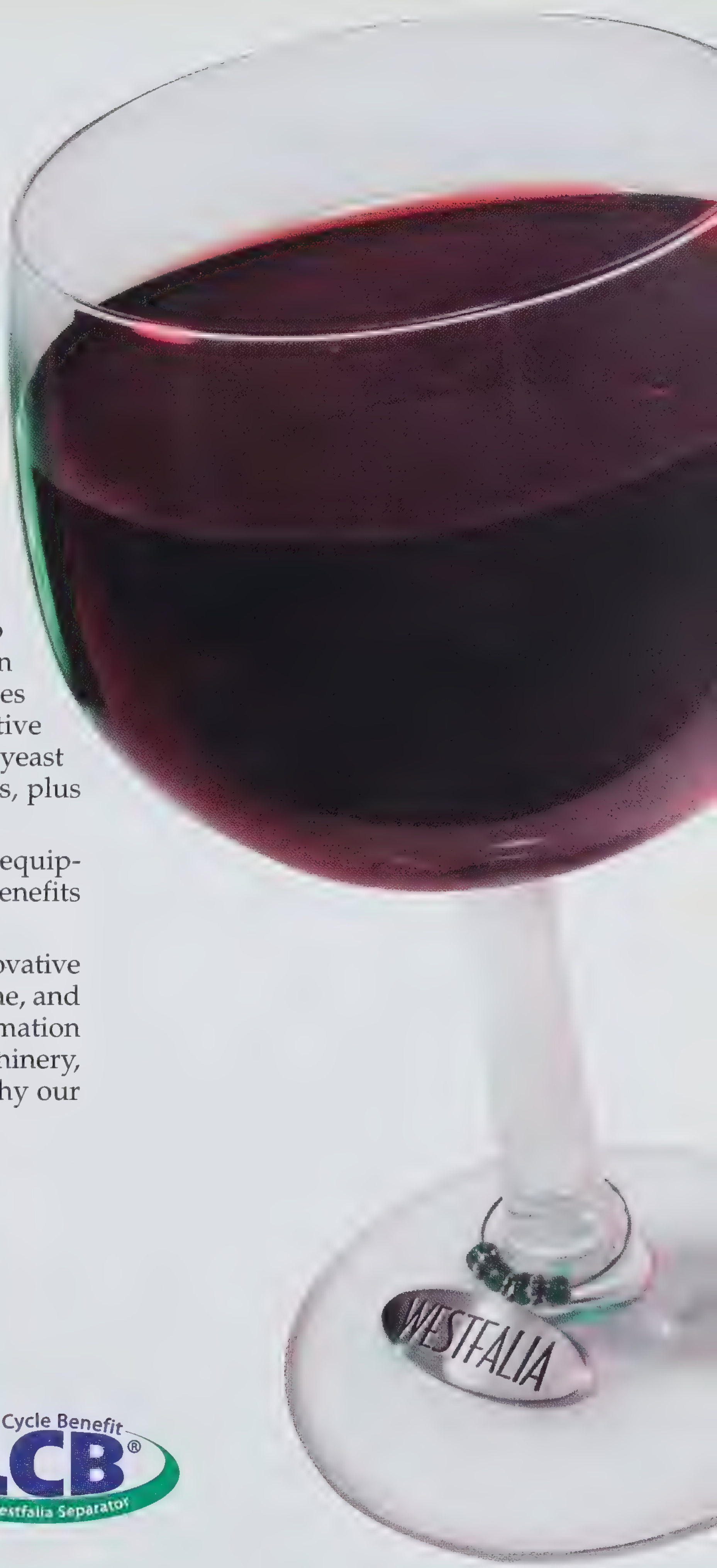

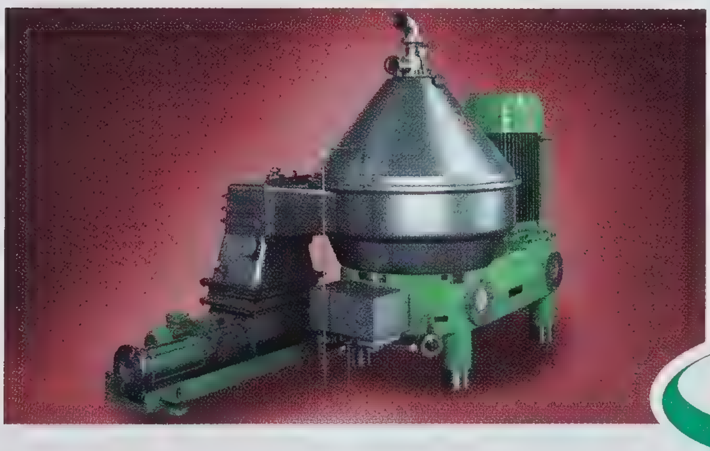

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effective as growers shared real vineyard experiences with reduced-risk pesticides and alternatives to nine commonly used pesticides under FQPA review (see Table III).

Managers for each of the demonstration vineyards continue to actively seek pest control strategies that are reduced-risk, effective, and support IPM-program goals.

Joe Votek of Loma del Sol Vineyard Management manages a 7.6-acre Sonoma Valley hillside vineyard planted to Merlot on a VSP trellis. To control early season fungal diseases at budbreak, including powdery mildew, Votek applies one to two lbs of dry, flowable sulfur tank-mixed with 0.5 to one pint of Champ® per acre.

"If we have a warm and dry spring, one application would be adequate," explains Votek. "However it is much more likely that we make two applications. In a cold, wet spring, a third application may be required." This was followed by two applications of 1% horticultural oil in 50 gallons of water per acre (JMS Stylet Oil®), to suppress mite — and perhaps grape leafhopper — populations, and for powdery mildew control.

Sulfur dust, beginning at 10 lbs and later increasing to 14 lbs per acre, was applied by Votek for powdery mildew control through the remainder of the season. The Risk Assessment Index model (Gubler 1999) is used to monitor powdery mildew pressure and to adjust application intervals ranging from seven to 15 days.

In 2003, there was high powdery mildew pressure, so Votek shortened dusting intervals. Treatments were effective in controlling powdery mildew in the demonstration vineyard.

Votek suggests that one note of caution is needed when applying horticultural oil for powdery mildew. Multiple applications of horticultural oil alone may not provide adequate control. He has also successfully used Serenade® in combination with horticultural oil in vineyards with a powdery mildew-susceptible variety or a history of powdery mildew hot spots.

Dennis Devitt, winegrowing manager for E&J Gallo Sonoma Laguna Ranch in the Russian River Valley, oversees a 7.6-acre block of Pinot Noir on a modified Geneva Double Curtain trellis within a 108-acre vineyard.

Gallo has used an electrostatic sprayer for pesticide applications, enabling efficacious pest control with low use rates. This included one application of 1.8% horticultural oil in 40 gallons of water per acre for early season mite suppression and powdery mildew control on blocks with previous early-season mite infestations. This provided effective control in the treated blocks.

About 30% of the Laguna Ranch required one miticide application in 2003, including an application of AGRI-MEK® at 0.024 lbs AI per acre to the

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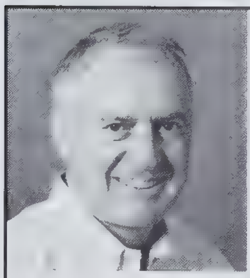
demonstration block in August. The outbreaks were effectively controlled without treating the entire ranch. Spot-treating only infested areas of the vineyard has proven to be another way for growers to reduce pesticide use.

John Clendenen of Clendenen Vineyard Management (Healdsburg, CA) used a similar strategy for early season mite suppression in a 6.6-acre Dry Creek demonstration vineyard planted to Merlot on a cordon Scott-Henry trellis. This hillside vineyard has a history of mite problems, and horticultural oil applications for early season mite and powdery mildew control were considered successful in 2002.

However, three applications of horticultural oil (2% and then 1.5% in 50 gallons per acre, followed by 1% in 65 gallons of water per acre) applied in 2003 did not provide season-long mite suppression. These results reinforce the need for pest and predator monitoring so that the efficacy of reduced-risk pesticides is tracked. If pest pressures are not maintained at tolerable levels, additional pesticide applications may be needed to protect the crop.

Keith Horn, vineyard manager at Clos du Bois Vineyards in Alexander Valley (Geyserville, CA), manages an 800-acre ranch on the Russian River. A

Continued on page 75



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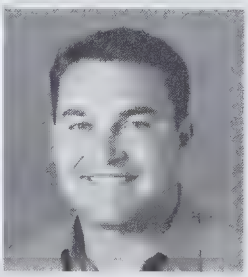
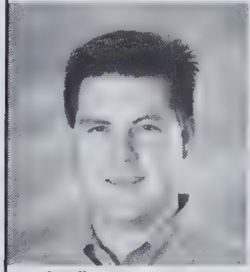


Greg Livengood, *California*

Chris Welch, *California*

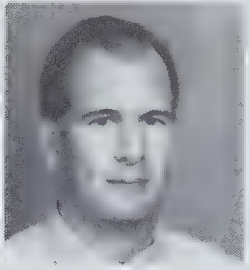
John White, *California*

Glenn Proctor, *grapes*

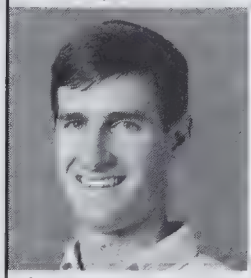


Brad Miller, *concentrate*

Andy Bivona, *concentrate*



Dennis Schrapp, *Canada*



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WINEGROWING

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Unique green certification program for grapegrowers

BY Laurel Marcus

Grapegrowers, environmental and agricultural organizations, elected officials, and members of regulatory agencies gathered at Clos du Bois Winery (Geyserville, CA) in August 2003 to celebrate the first group of farms certified under the Fish-Friendly Farming (FFF) Program. The 20 newly certified properties encompass 10,000 acres in Mendocino and Sonoma counties, including vineyards.

Fish-Friendly Farming provides third-party certification that documents environmentally friendly land practices. The program addresses a number of issues that concern grapegrowers:

- How to interpret and comply with the maze of state and federal environmental regulations, including the Clean Water Act and Endangered Species Act;
- How to manage their lands using sustainable and environmentally beneficial practices;
- How to distinguish themselves to the consumer and community as environmental land stewards.

In Sonoma and Mendocino counties, FFF addresses a number of sensitive environmental issues. Among them are the need to improve water quality affected by "non-point" sources such as agriculture, and the need to restore the once famous salmon and steelhead fisheries in places such as the Russian and the Navarro rivers.

Agriculture, along with many other land uses, contributes to these environmental problems. However, unlike the permanent problems created by urban sprawl or large reservoirs, farms can change practices, restore creeks, and directly participate in improving rivers and streams.

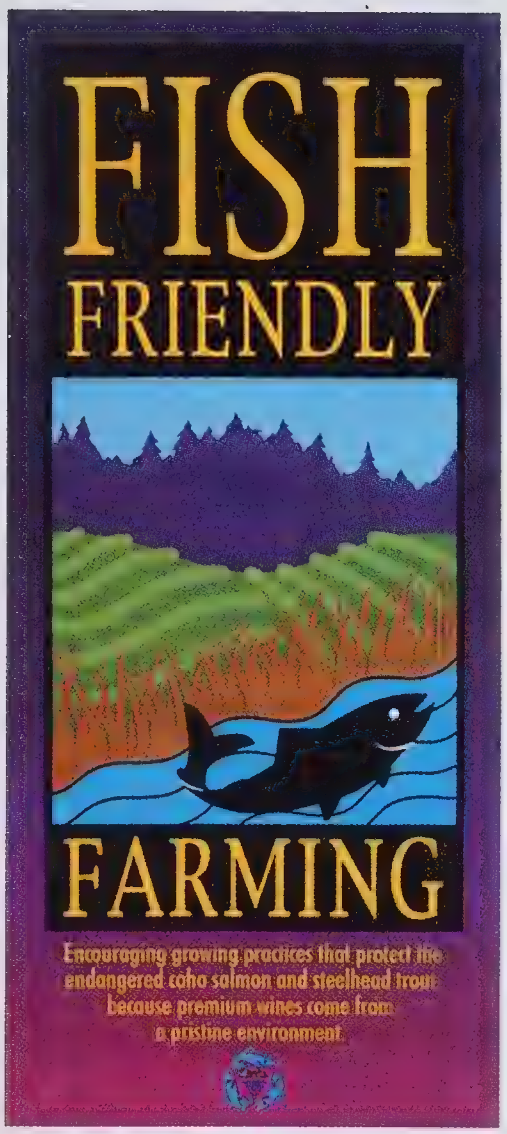
Program origins

The Fish-Friendly Farming program was developed and is currently directed by this writer's private firm — Laurel Marcus and Associates Guerneville, CA— of natural resource planners and scientists. The program has served more than 70 property owners and land managers with workshops since its inception in 1999. Feedback from participants has indicated their appreciation of the program's flexible approach, solid scientific basis, and the fact that it was developed specifically for farmers. At the request of agricultural and environ-

Laurel Marcus has over 20 years of watershed, river, and wetland restoration experience, working extensively in the watersheds of northern and central California to restore fish and riparian habitat and repair erosion sites. Marcus is the author of the Fish-Friendly Farming Program, which she directs in the watersheds of the Russian, Gualala, Navarro, and Napa Rivers.

Top left: Fish-Friendly Farming program helps landowners and managers revegetate along streams and restore fish and wildlife habitat while reducing bank erosion and Pierce's disease.

Bottom right: Many farmers along the Russian River (Sonoma County, CA) revegetate stream banks and riparian corridors by planting willow cuttings.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Encouraging growing practices that protect the endangered coho salmon and steelhead trout because premium wines come from a pristine environment

mental groups, the FFF program began in Napa Valley in January 2004.

Growers sign up for a series of four two-hour workshops held in January through March. They receive the FFF program documents, which include a thick binder of Beneficial Management Practices (BMPs), which serves as a reference manual, and a Farm Conservation Plan template, which is filled in and eventually certified for the property.

Each farmer receives a topographic map, custom color aerial photograph, and soil map for their site. The workshops review the BMPs, which are organized into elements — designing a new vineyard, managing the existing vineyard and replants, road repair and management, creek and river corridor restoration, and others. Each farm plan is different because it addresses the particular features of the property, and any needed changes.

Three-phase methodology

The farm plan follows a simple three-phase methodology:

- Inventory the property and its current management regime;
- Apply BMPs as needed;
- Formulate an implementation program.

The farmer, assisted by the program, completes a detailed inventory of the natural and human-made features of the site. These include vineyard areas, past land uses, steep slopes, soil types and erosion hazards, existing erosion sites, all

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year-round roads (including those from previous ranching or timber harvest activities), vegetation types, the entire stream network from headwater creeks and hillside swales to the main creek or river, and water storage facilities.

Land management practices are also inventoried: including soil conservation practices, such as winterization with cover crops and use of erosion control measures next to waterways; vineyard road winterization and management; chemical use; water sources and conservation; vineyard drainage systems and their potential for eroding hillside creeks or need for upgrades in sizing; all year-round roads, including the condition and management of ditches, culverts, creek crossings, bridges and fords; and creek corridor management, including vegetation removal for Pierce's disease. The entire property is inventoried in the farm plan, not just the vineyard, because regulations cover the overall property.

Coming into compliance

This extensive inventory is completed by program scientists through a one-on-one consultation with the grower or owner. Road and creek assessments are technical in nature and too great a burden for the grower to accomplish without assistance. However, due to the need for management in most road systems, the grower takes part in the assessment and in determining the BMPs and repair strategies to be applied.

For each element or section of the farm plan, the inventory and one-on-one field visit identify where the grower is currently implementing the program BMPs and where improvements are needed.

An assortment of improvements may be called for — from increased winterization and erosion control in the vineyard area, to major repair of old roads, to revegetation and restoration of hillside swales or creek corridors. For major projects, the program provides design and funding assistance and allows up to 10 years for implementation.

Funding for the program, including the implementation of larger projects such as road repair and creek restoration, comes from various state and federal sources such as the State Coastal Conservancy, State Water Resources Control Board, Environmental Protection Agency, and National Oceanic and Atmospheric Administration.

A completed farm plan is a comprehensive document that addresses the particular needs that a property has to comply with the federal Clean Water Act, Endangered Species Act, California Fish and Game Code, and local ordinances. For new vineyards, the plan revises the site designs to avoid impacts

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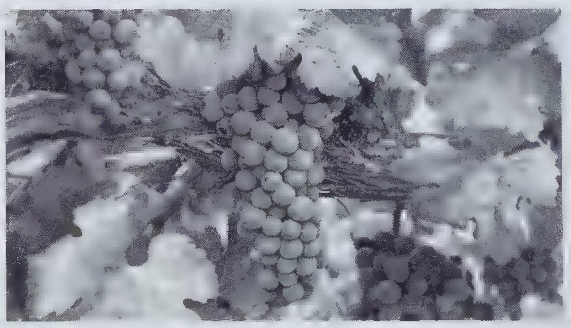

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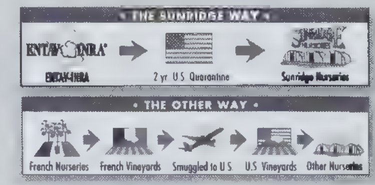

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and costly mitigation that might otherwise be required under regulatory processes and the California Environmental Quality Act (CEQA).

In addition to regulatory compliance, the BMPs reflect management measures that are sustainable and benefit the vineyard over the long-term. For example, vineyard development is discouraged on slopes in excess of 30%, on soils with a high erosion hazard or unstable areas. Integrated pest management, often incorporating cover crops and native plants, and decreased-to-no use of high toxicity chemicals is encouraged.

Multi-agency certification

Finally, the FFF program offers a third-party certification by three regulatory agencies — National Marine Fisheries Service, California Department of Fish and Game, and the Regional Water Quality Control Board — who have agreed to work cooperatively in reviewing each farm plan and judging it for completeness, accuracy, and a commitment to implement needed BMPs and projects.

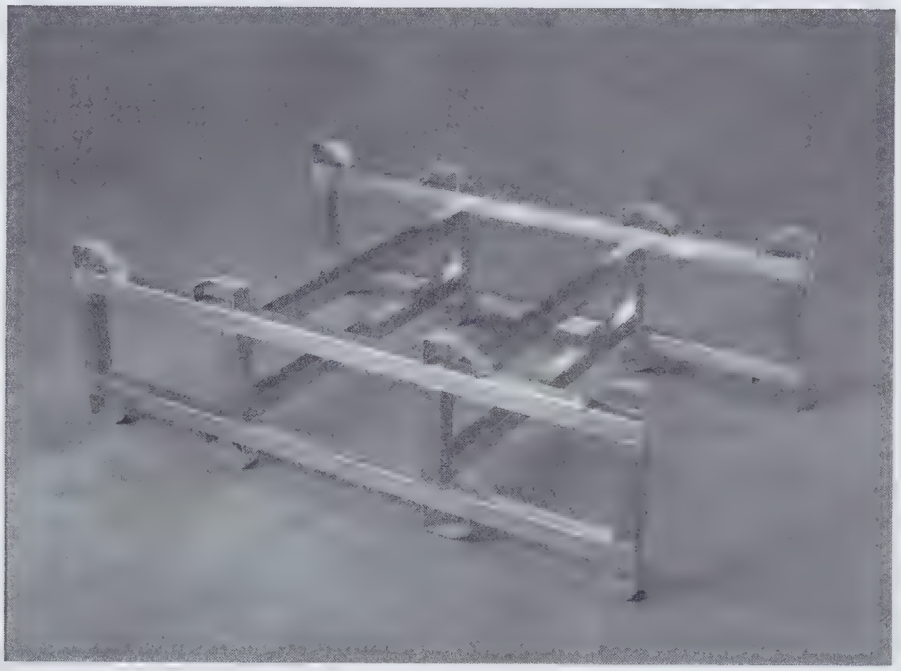
Third-party certification from well-known agencies lends great credibility to the FFF program. Certified growers receive a letter from each agency recognizing their farm plan and actions as leading to compliance with regulations. Growers also gain access to the FFF trademark and marketing materials to distinguish their property for its environmental stewardship. The certification requires effort and a commitment by growers, and is recognized by environmental groups.

"Friends of the River supports the FFF program because of the large environmental benefits gained from cooperation with farmers and landowners in restoration projects and the comprehensive nature and sound scientific basis for the program," says Betsy Reifsnider, executive director of the statewide river conservation group.

As the marketing phase of the FFF program grows, it is hoped consumers will also participate in environmental improvements through their recognition of the FFF program and selection of certified wines. Such wines will be distinguished through a combination of advertising, tasting room information, the FFF website, and other winery communication materials. There will be no FFF information on bottle labels.

Diverse initial group

The first group of growers certified under the FFF program is diverse. Small vineyards to very large ranches are included. Golden Vineyards in Redwood Valley and the King Ranch near Ukiah have large property hold-



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ings of 800 to 1,000 acres with vineyards of less than 80 acres. Small vineyards of five to 40 acres were also certified.

Wineries that have certified vineyards include: Simi Winery (Healdsburg), Clos du Bois Winery (Geyserville), Navarro, Greenwood Ridge, and Husch wineries in the Anderson Valley, and two Fetzer vineyards in Mendocino County. More vineyards owned by Fetzer and Bonterra are enrolled for the next certification round.

For Fetzer Vineyards, the FFF program added new elements to its ongoing commitment to organic farming and sustainability, "The Fish-Friendly Farming program rounded out our operation by bringing erosion control practices on roads and environmental enhancement and restoration projects to our streams," states Tom Piper, Fetzer vineyard manager. "We've learned to go beyond accepting what we have to enhance it for fish and wildlife."

An example of Fetzer's environmental improvements is the installation of a basin to catch road runoff and reduce sediment in waterways within a new vineyard development.

Clos du Bois has completed restoration of Lytton Creek on its property near Geyserville by removing several rows of vineyard and replanting native riparian species, such as spicebush, box elder, big leaf maple, and oaks.

Clos du Bois is also involved in removing Arundo donax, or giant reed, an invasive grass that grows to 30 feet tall and has no value to fish and wildlife. The Arundo has spread to many locations on the main channel of the Russian River and requires several years of removal and re-treatment.

Vineyard manager Keith Horn explains, "Clos du Bois is starting a project with a local non-profit organization, Circuit Rider Productions Inc., to clear, chop, and compost the cut Arundo, to greatly reduce the cost of the project."

Simi Winery has seeded several cover crop mixes, including California brome, meadow barley, molate fescue, Zorro fescue, and yarrow, to prevent soil erosion, and created a 350-foot-wide wildlife corridor along one-half mile of Maacama Creek in Alexander Valley. "This area has one of the largest and most ecologically diverse wildlife habitats," says Alberto Zamora, Simi vineyard manager.

Simi planted native trees and shrubs to replace invasive non-native blue periwinkle and to enhance the creek for steelhead trout and the corridor for other wildlife. "Mountain lions, deer, raccoons, and many types of birds have been observed in the creek corridor," reports Zamora.

For wineries in the Anderson Valley, the FFF program brings

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another benefit. While vineyards comprise only 5% of the drainage basin of the Navarro River, local environmentalists frequently name them as the prime cause of problems. Third-party certification helps to distinguish growers for their environmental stewardship efforts.

Navarro Winery has rehabilitated a former sheep ranch and planted thousands of redwoods on previously logged lands. Historic erosion sites have been repaired and old roads upgraded and repaired, while vineyards have been planted on less than 10% of its overall property. The vineyards are each separately fenced to allow wildlife access and movement to the restored forest and grasslands.

Greenwood Ridge Winery also has rehabilitated and revegetated a large, heavily logged-over, hilly property to protect fish and wildlife areas, while only 2% of the property is in winegrape production.

Future blueprint

The Fish-Friendly Farming program represents a future blueprint for agriculture in a California dominated by environmental concerns. As more grapegrowers volunteer for this certification program, they demonstrate the value the wine industry places on a healthy environment, and its commitment to sustainability for both farms and endangered fish. ■

For more information, contact: Laurel Marcus, 707/869-2760; laurelm@ix.netcom.com.

To sign up for the program, contact: Sotoyome Resource Conservation District — Mendocino and Sonoma counties, 707/569-1448; karah@sonic.net or Napa County Resource Conservation District, 707/252-4188; leigh@naparcd.org.

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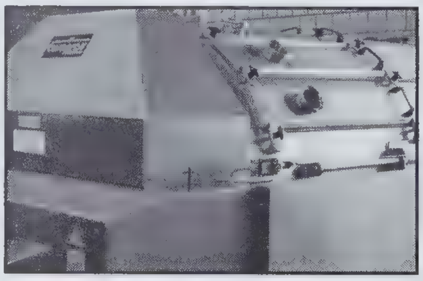

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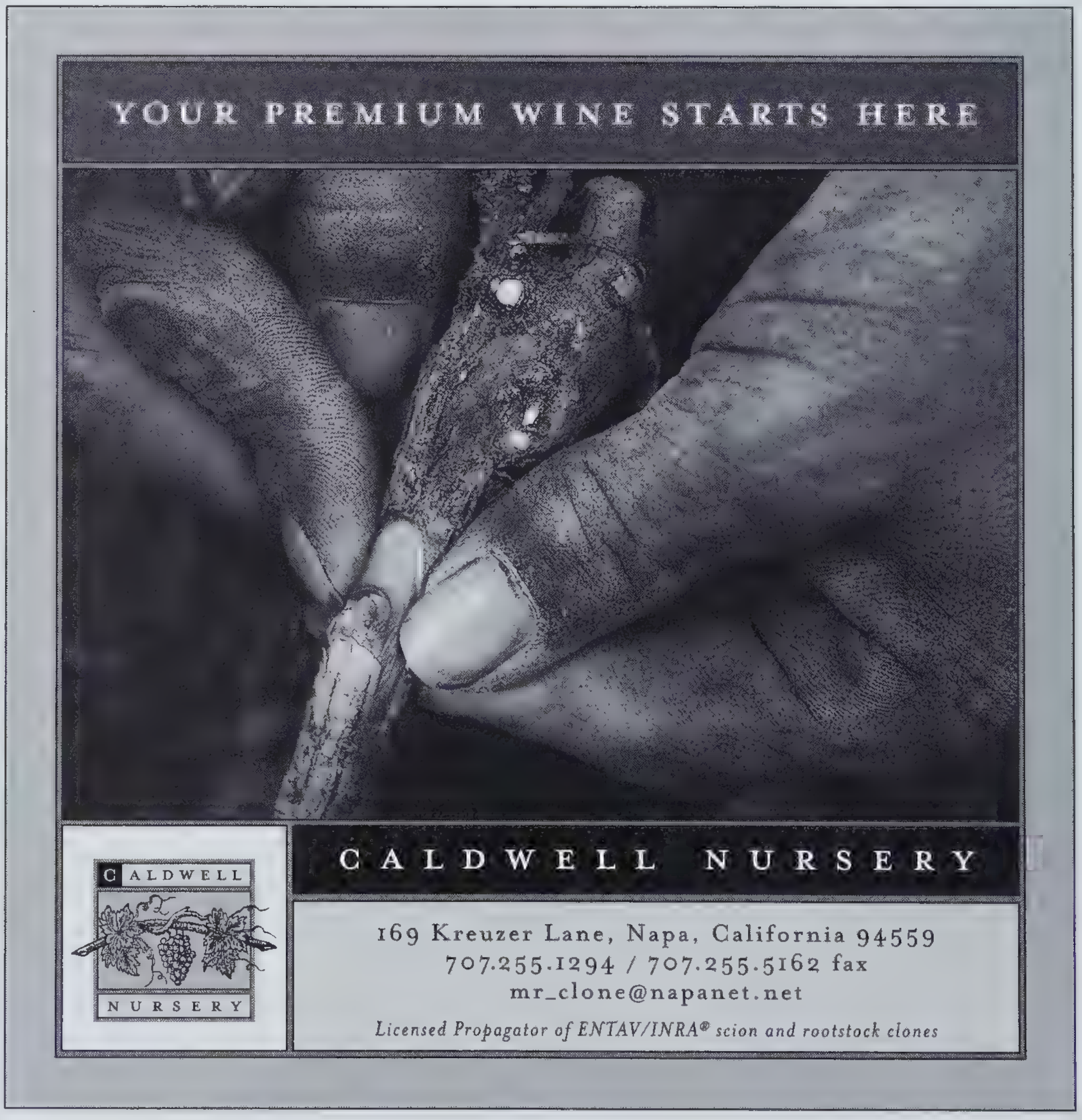

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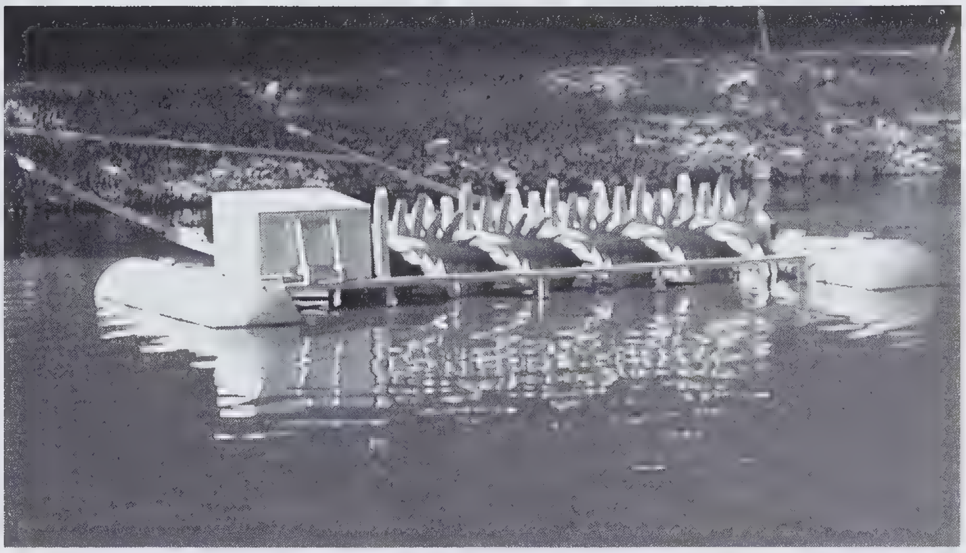
Improved wastewater treatment at Hess Collection Winery



Hess installed a floating horizontal brush aerator to improve efficiency and oxygen transfer capacity.

BY Larry W. Moore, Ph.D., P.E., DEE

Winery wastewater treatment at Hess Collection Winery (Napa, CA) features floating horizontal brush aerators, data logging, and computer monitoring and control to simplify required water quality reporting. Since installation in 2001, Hess Collection Winery has never been out of compliance with state discharge limits.

Wineries generate a strong organic wastewater that is highly variable in quantity and quality depending on production activities. Dissolved constituents in the wastewater include sugars, ethanol, organic acids, aldehydes, other microbial fermentation products, and soaps and detergents from cleanup operations.

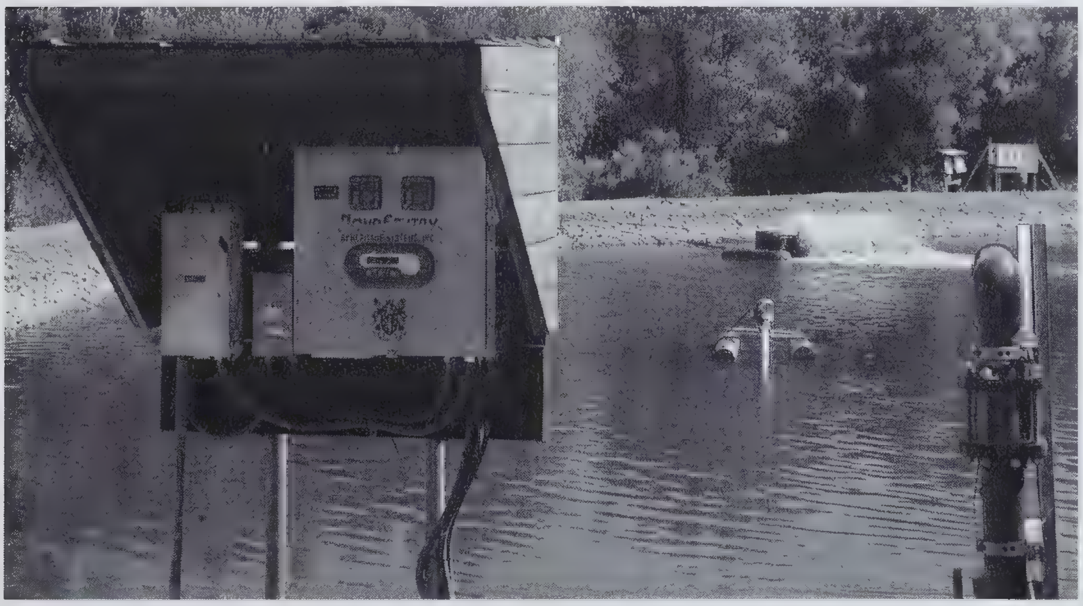
Large suspended matter consists of grape skins, leaves, stems and seeds, while smaller suspended particles are primarily dead yeast cells and cell fragments (lees), grit, dirt, diatomaceous earth, and bentonite.

Winery wastewater typically is low in pH because of organic acids produced in the fermentation process. Winery wastewater generally has sufficient phosphorus but is deficient in nitrogen and other trace minerals, which are necessary for efficient biological treatment.

Variability in wastewater composition depends mainly on the season and the particular operations being conducted at any given time. Maximum organic loading usually occurs from early September through early November (harvest season). Certain winemaking operations — such as cleaning of the crusher, pomace conveyors, presses, and fermentation tanks — can also generate high strength wastewaters.

Other process wastewater includes washing of storage tanks, bottling and other equipment, and wine racking. Total Hess Collection Winery wastewater includes the process wastewater, cooling water, and sanitary wastewater from about 50 employees, more than 100 daily visitors, and 100 residents of an onsite monastery.

Total average daily wastewater flow rates are approximately 10,000 gallons per day (gpd) during the wine bottling period (January through early September). During harvest, total wastewater flow rates generally average about 26,000 gpd. The highest BOD_5 (biochemical oxygen demand) loadings are approximately 1,000 to 10,000 mg/L (200 to 2,200 lb/day). In December, facility cleaning contributes to about 30,000 gpd of total wastewater.



Pond Sentry™ control panel manages operations of the brush aerator for Pond #1.

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Average annual wastewater total flow is about 14,000 gpd. Because of the significant sanitary wastewater component, the combined wastewater likely contains adequate nitrogen, phosphorus, and micronutrients for effective biological wastewater treatment.

Traditional treatment processes for winery wastewater

Because it is a strong organic waste, winery wastewater is suitable for biological wastewater systems. The most common type of biological treatment system is an aerated lagoon or ponds. Activated sludge, sequencing batch reactors (SBRs), and artificial wetlands are used by some wineries. Each of these processes is capable of producing an effluent that is suitable for spray irrigation of vineyards, woodland, or other suitable land.

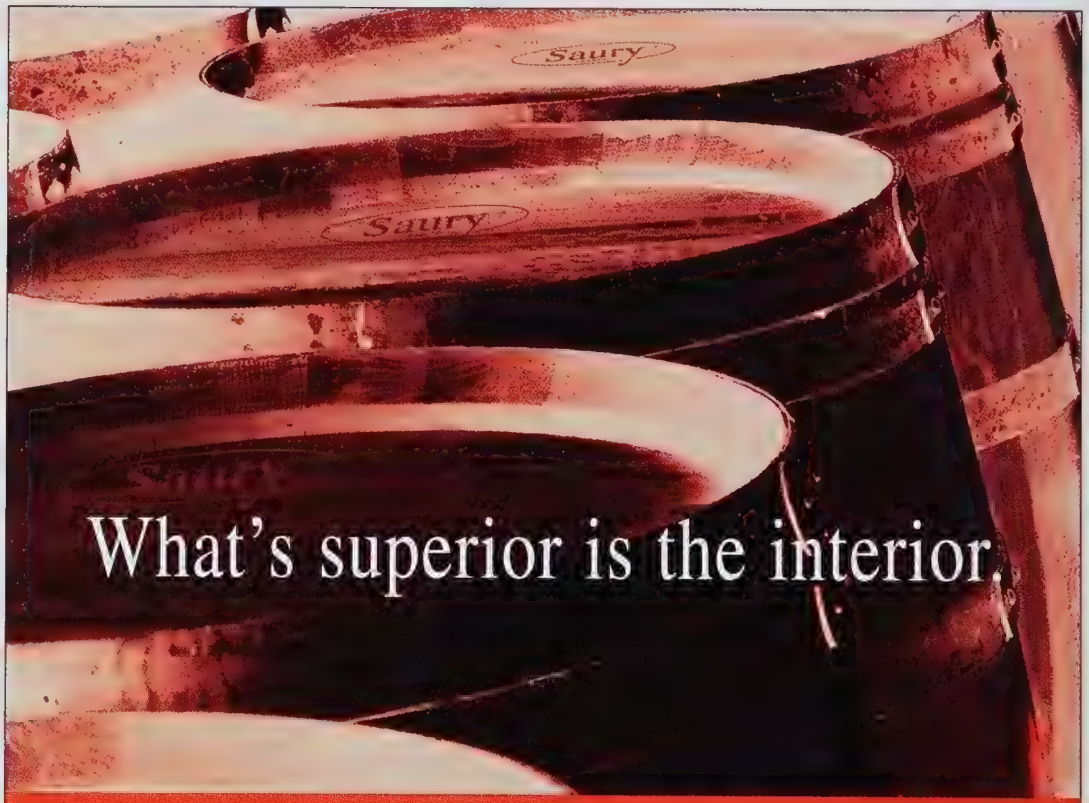
Some wineries have leachfields, which are biological systems in that they rely on microbial treatment within a soil column. Leach fields placed below the upper aerobic soil layer tend to have little to no treatment, resulting in discharge of high-strength winery wastewater to the groundwater table.

Biological treatment systems are economical and provide BOD and suspended solids (TSS) removal. Aerated ponds generally perform well and are usually reliable. They are low maintenance, mechanically simple systems that minimize the amount of operator attention required.

Aerated ponds are capable of handling surges in hydraulic and/or organic loadings that are common to wineries. When properly designed and operated, the potential for environmental problems (odors, ground and surface water contamination) is minimal.

Wastewater management at The Hess Collection Winery

The wastewater management system at The Hess Collection involves pollution prevention measures and end-of-pipe wastewater treatment. Pollution prevention involves careful management of wine production and



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ancillary activities to reduce wastewater volumes and loadings.

During cleanup operations the winery uses pressure washers, which emit a high-pressure, low-volume spray. Sump screens are cleaned daily to help reduce suspended solids loading to the ponds. For hand-held washing operations, winery staff use pistol-grip nozzles.

Screens are placed over floor drains to prevent skins and seeds from entering the process drain. In addition, lees and bentonite are allowed to settle in tanks and are separated from the process water prior to wastewater treatment. Lees and bentonite solids are taken to a sanitary landfill for final disposal. Typical of many wineries, these pollution prevention measures reduce process wastewater volumes and pollutant loadings.

The Hess wastewater treatment system consists of two aerated ponds (in series), located more than 1,500 feet downhill from the winery. Most wineries benefit by introducing aqua ammonia for nitrogen addition and pH adjustment. However, this is not necessary at Hess Collection because of the impact of sanitary wastes on raw wastewater quality. The pH of the raw wastewater is typically in the range of 5.5 to 8.5.

Process monitoring and control of the wastewater treatment process is accomplished by recording influent wastewater flow, recording and data logging of pond pH, dissolved oxygen (D.O.), and freeboard accomplished by an automatic aeration control system.

The original treatment ponds were constructed in the 1960s. Until 2001, aeration in the ponds was provided by conventional vertical, splash aerators and/or aspirating aerators. Pond #1 has a volume of approximately 1.7 million gallons, providing an average detention time of 65 days during harvest and 94 days during the wine bottling season. Land-application returnflows, which are minor compared to influent flows, were excluded from detention-time calculations.

Aeration

In 2001, the winery renovated the pond electrical system and installed floating horizontal brush (FHB) aerators in Pond #1. Primary reasons for improvement of the treatment system were inadequate oxygen transfer capacity of the former aerators and the winery's commitment to using more efficient aeration equipment. The FHB aerators were manufactured by S&N Airoflo, Inc. (Greenwood, MS).

Two 10-horsepower (hp) FHB aerators in Pond #1 provide more than 1 mg/L oxygen level and mixing and directional water movement to prevent short-circuiting. One 7.5-hp aspirating aerator (original unit) provides additional oxygen transfer and minimal mixing capability. Two 10-hp FHB aerators, which are about twice as efficient as aspirating aerators, are located on opposite sides of Pond #1 to provide a serpentine mixing pattern.

These FHB aerators can transfer up to 1100 lb/day of oxygen to the pond to satisfy the oxygen requirements of

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pond microorganisms under most BOD-loading conditions. For 80% BOD removal in Pond #1, all three aerators can meet oxygen requirements at peak BOD loading of 1100 lb/day.

The aerators create distinct flow patterns inside two lobes. In each lobe, water is pushed away from the aerator and then pulled back to the aerator, providing numerous passes through the flow patterns, which helps to minimize short-circuiting (wastewater exiting the ponds in a time less than the calculated detention time). The shape of the active mixing zone is determined by the sides of the ponds and the closeness of the unit to the edge of the pond.

Pond #2 (about 1.6 million gallons) has two 5-hp vertical splash aerators (original units) for mixing and oxygen transfer prior to land application of the treated wastewater. The water level in Pond #2 fluctuates depending on raw wastewater flow rates and the effluent land application rate as well as precipitation and evaporation. In anticipation of higher wastewater volumes during harvest and during heavy rain periods, the winery tries to have both ponds at a depth of five feet prior to harvest.

Wastewater flows from Pond #1 to Pond #2 by gravity or it can be pumped as necessary. Because gravity flow from Pond #1 is rather slow occasionally, the winery can activate pumps to increase the transfer rate. BOD removal in each of the two aerated ponds is approximately 85% to 90%. Effluent from Pond #2, which is land-applied, is less than 50 mg/L of BOD_5.

Dissolved oxygen control

A unique feature of the aerated ponds system is the real time monitoring/data logging and D.O. control system manufactured, installed, and maintained by Heritage Systems, Inc., (Napa, CA). The PondSentry™ monitoring/control system consists of a control panel that contains pH and D.O. analyzers, a microprocessor, data logger, cellular modem, and associated sensors.

The PondSentry™ system is currently used to measure freeboard, D.O. levels, pH, influent flow rate, and aerator run times. The unit starts and stops aerators automatically at user-defined set points. The system software allows the microprocessor to make smart decisions about operating the aerators, to ensure optimum performance and energy conservation.

D.O. and pH sensors are mounted in a float to allow monitoring of water approximately one foot below the surface. The float, located in the center of the pond, is suspended from a pulley system. An ultrasonic freeboard sensor is suspended by a retractable boom over the water surface. Heritage Systems technicians visit the ponds to clean and calibrate the probes and sensors every two to three weeks.

The patent-pending PondSentry™ system determines when the aerators are activated and deactivated, alternates operation of the three units, and records total operating time of each aerator. This system saves the winery about $1,000 per month in electrical costs due to reduced aerator run times.

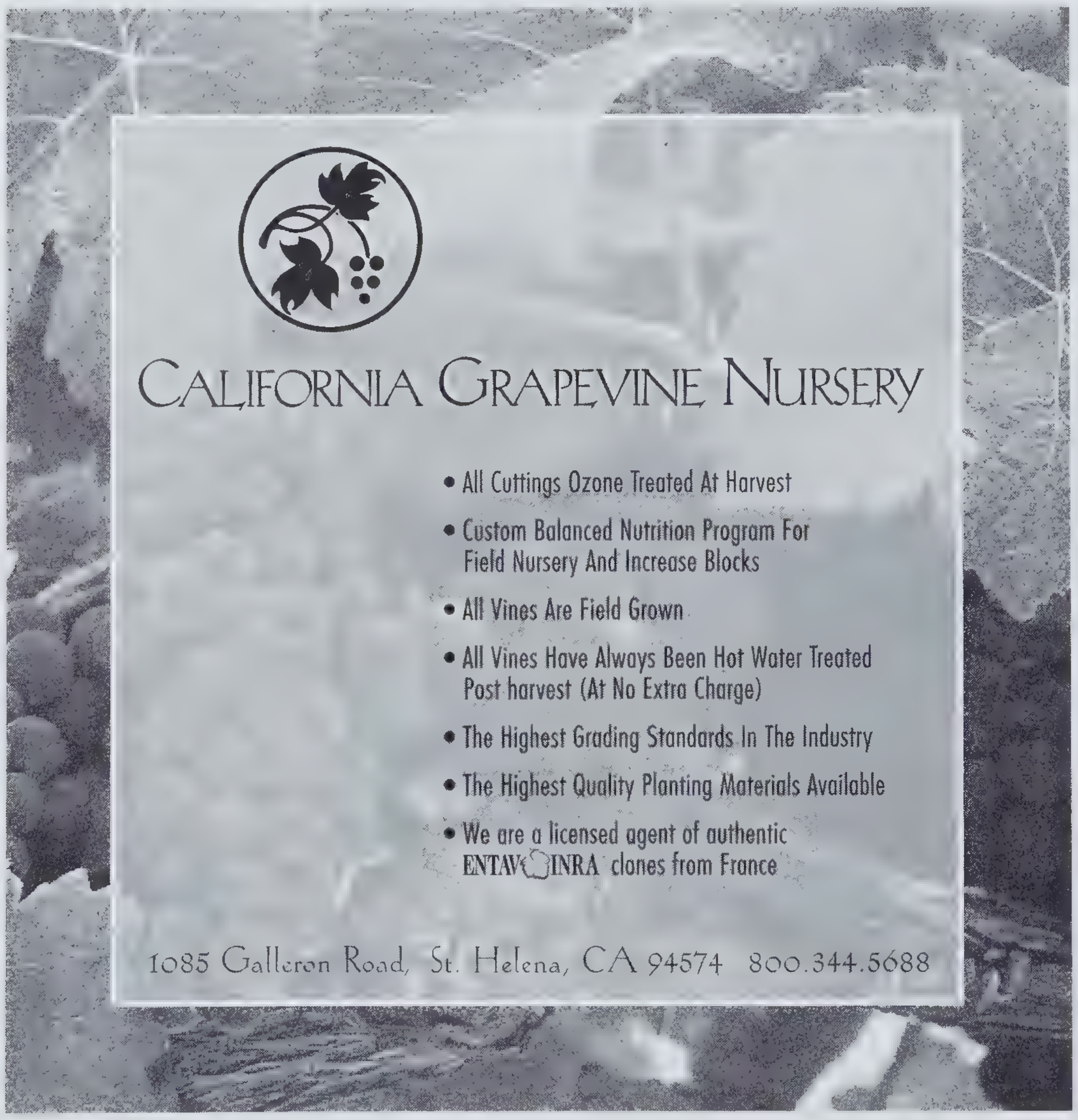
At current settings, the PondSentry control system enters all measured parameters into a data logger. Heritage Systems retrieves the data and generates monthly and quarterly California Regional Water Quality Control Board (CRWQCB) compliance reports for Hess Collection Winery.

Heritage Systems provides all of the above mentioned products and services for a fixed monthly fee. The PondSentry™ system is owned, installed, and operated by Heritage Systems, requiring no capital budget or maintenance costs that would impact the winery. With the improved aeration efficiency and control, Hess Collection is consistently in compliance with CRWQCB discharge limits.

Beneficial reuse of winery effluent

Although low in BOD and TSS, the treated wastewater has some residual macronutrients and many micronutrients (primarily iron, manganese, zinc, boron, copper, and molybdenum) that can enhance plant growth. During biological treatment, some of the nutrients are converted to other forms.

For example, some ammonia-N will be converted to microbial cell mass and may exit the system as organic nitrogen.



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Because of the long detention time, some ammonia-N will be oxidized to nitrite-N and nitrate-N via nitrification.

The final effluent is applied to a 0.9-acre woodland adjacent to the aerated ponds. At 14,000 gpd over 0.9 acres, with an adjustment for pond evaporation and five weekdays of winery operation, the average daily wastewater application rate is 0.36 inches per day.

Wastewater is pumped from Pond #2 through an effluent distribution system consisting of 3-inch, 2-inch, and 1-inch plastic pipes, and four sprinkler heads. Regulatory restrictions require that wastewater cannot be land-applied 48 hours prior to a rainfall event, during the event, or within 48 hours after rainfall.

Depending on local weather conditions, and under the parameters of their discharge permit, pond effluent is land-applied. Runoff from the land application area is collected in earthen trenches and routed back to Pond #1. This ensures that no wastewater effluent is discharged to a receiving water body.

In slow rate land application, applied wastewater is treated as it flows through the soil matrix, and a portion of the flow may percolate to shallow ground water. The wooded land application site has a moderately steep (approximately 10%) slope. Therefore, percolation to ground water is reduced and runoff is collected. Because runoff is occasionally produced, this system could be referred to as an overland flow system. However, all runoff is collected and rerouted to the aerated ponds.

Advantages of slow rate systems are:

- Treatment of applied wastewater;
- Water conservation, by replacing potable water with treated effluent, for irrigating landscaped areas;
- Preservation and enlargement of forested areas.

The requirements for spray land application are a BOD_5 concentration less than 80 mg/L, TSS less than 80 mg/L, D.O. greater than 1.0 mg/L, and settleable solids less than 1 ml/L. Land application of the treated effluent provides water and nutrients which are consumed by forest vegetation if applied at agroeconomic rates.

In addition, through percolation and evapotranspiration, the pond effluent is disposed of in the land application system. This approach eliminates the need for a direct discharge of treated wastewater into surface waters. Therefore, this system enhances environmental quality in Napa Valley. ■

Larry Moore is an environmental engineer at the University of Memphis, Memphis, TN and consultant to S&N Airoflo, Inc.

For more information, contact:
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MICRO-OXYGENATION

Lessons from a decade of experience

BY Don Blackburn

Application of micro-oxygenation (MOx) for the purpose of taming tannins, integrating vegetal aromas, and stabilizing color has become an accepted practice in many successful U.S. wineries over the past decade.

Today, it is appropriate to evaluate the lessons learned in these real-life situations. Sharing these lessons can help users of MOx increase efficiencies and help new users avoid the errors already made by others. Let's begin by comparing three MOx scenarios that vary in the intentions of the winemakers. These are not a roadmap describing a three-way divergence, but rather examples chosen among many possible circumstances.

Life in Micro-Hell

Scenario One: Fred has a gleeful glint in his eyes when he unwraps his new MOx box before harvest, but his joy turns to disappointment when, mid-harvest, a forklift knocks over the cart-mounted machine and smashes it. Fred has failed to treat his jerry-rigged MOx set-up as one requiring special attention.

Scenario Two: Al tolerates the scary premature browning he observes in early MOx work because he likes the texture and aroma effect. Eighteen months later he is chagrined to find the MOx treatment and the control are exactly the same.

Scenario Three: Pete spent three years transforming his San Joaquin Valley winery into a hip, premium producer: His growers were managing their water and crop load well, his maturity assessment team was picking ripe but not overripe, and he was getting big wines with active tannin and vibrant color.

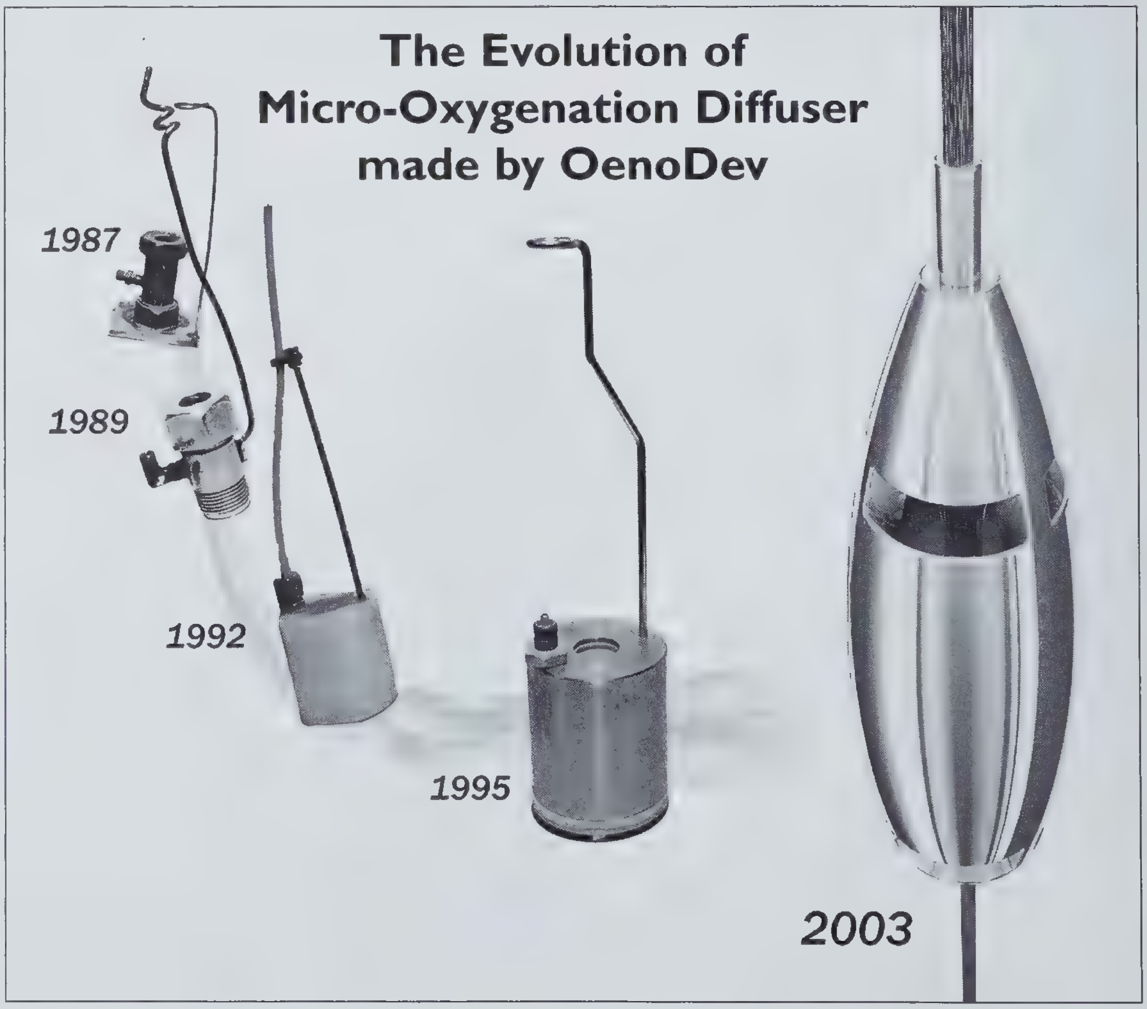
For the Syrah, Cabernet, and Petite Sirah, the tannins needed taming via some serious work with oxygen. So he worked phase one at 50 to 80 barrel equivalents for a month or so, and got fine, melted tannins, then completed malolactic fermentation (MLF) and added SO_2. As always, he sent around approval samples to his bulk contract buyers in mid-December. All these lots were rejected. Buyers complained of harsh tannin, H_2S, and lack of fruit. Pete is spending Christmas staring at the shotgun.

Solutions to these quandaries are given below. But first, a little background.

The road from Perdition

The repeal of Prohibition and the advent of the 20th century technology boom inspired new wineries to modernize by introducing hygiene and scientific measurement into our age-old craft. The goal was defect-free, consistent quality. But today, that quality is merely assumed, and no longer provides marketing advantage. The increasing sophistication of the 21st century wine marketplace imposes demands on our winemaking skills well beyond a clean, safe beverage.

Winemakers now need to make wine that isn't just sound and agreeable; it must be evocative enough to justify a hefty bottle price. The skills required for such quality production may lie within the winemaker's arts we rejected during the last century, when traditional winemaking was driven from the field by electricity, stainless steel, packaged microorganisms


The Evolution of Micro-Oxygenation Diffuser made by OenoDev

Don Blackburn spent his first six harvests in France where he received a bachelor of science degree in enology and viticulture. He has made wine in California since 1982 and has contributed to **PWV** *since 1985.*

and inert gas. As the juggernaut of technology revolutionized the physical practices of enology and viticulture, certain ideas that seemed outmoded to many people continued to exert an influence on a few practitioners. Among these ideas were the concepts at the root of MOx, which were developed in France.

French winemakers tend to treat oxygen the way a carpenter treats a saw — as a dangerous but essential tool. The vinification and racking methods developed in the 17th and 18th centuries (practices that led to the creation of age-worthy wine) are tailored to introduce oxygen to the levels required by the wine's evolution. Studying these methods leads to the inescapable conclusion that a proper oxy-reductive regime from harvest to bottling is a main theme of traditional winemaking.

French enologist/innovator Patrick Ducournau led the way in the 1990s to a novel but effective rationale in the production of big red wines from the sunlit climes of southern France and the New World. These wines either took too long to soften or were so imbalanced that they went astray during ageing and never achieved their potential. The ample tannin load of these reds was — and remains today — their central challenge.

MOx is just the centerpiece of an approach to managing these wines, a component of a whole system of *élevage.* This French term describes wine production as the *rearing* of wine — as one would a child. It recognizes that many essential decisions must be made intuitively when numerical justification is absent.

Élevage combines rationalism and empiricism, as both reason and observation alternate as pathways to optimal (but never demonstrably perfect) achievement. The MOx approach to *élevage* includes a sophisticated knowledge of oak functionalities, press wine blending, lees management, and temperature control.

Some red wines of southwestern France (and some California Reserve Cabernets) have a propensity to retain an aggressive astringency that outlasts the wine' s fruit. The goal of MOx is to integrate the phenolic structure of a wine via two parallel pathways. First,

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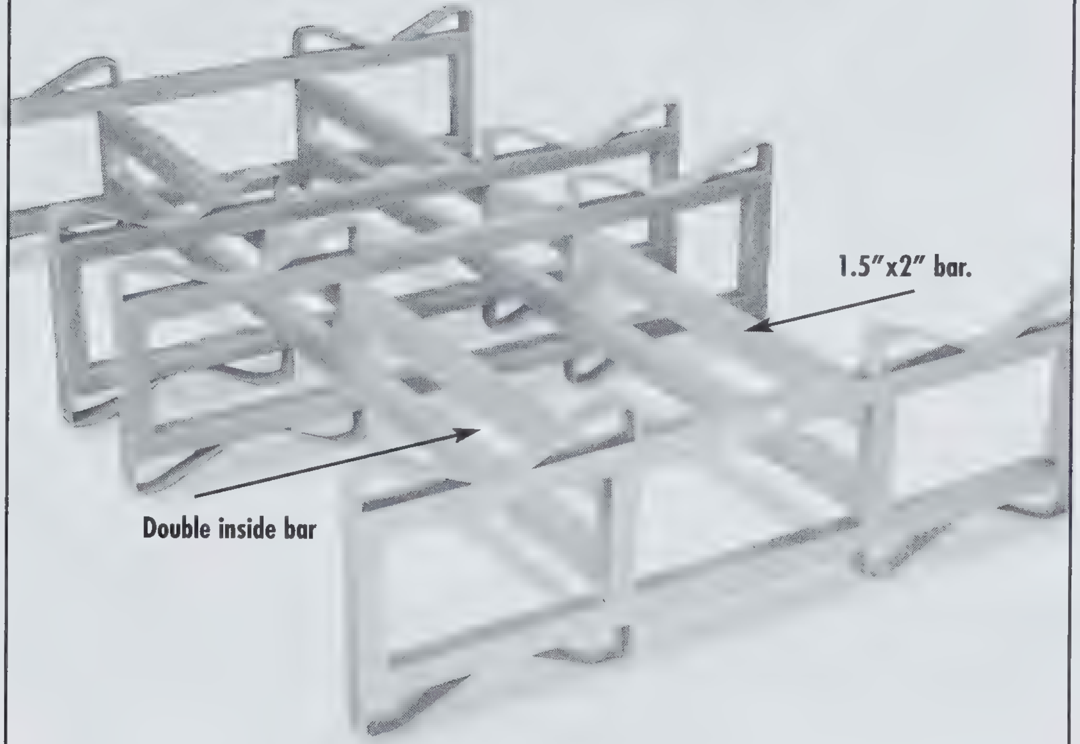

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improved conditions of polymerization lead to a superior mouthfeel Second, the less reductive MOx environment eliminates sulfides and integrates herbaceous aromas.

MOx allows us to create a wine of tactile breadth and organoleptic nuance, in which balance takes precedence over sheer, undifferentiated intensity. A wine with broad enough shoulders to carry all the flesh nature gave it is elaborated over time the same way a born marathoner nevertheless must train relentlessly to build lung capacity and lean sinew.

Micro-oxygenation is sometimes misnamed as micro-oxidation. The goal of micro-oxgenation is to avoid oxidation by using oxygen to improve reductive strength. We focus on the physical element, because we *control* the quantity of O_2 added, while we *infer* the chemical results as a function of sensory analysis and the presence of dissolved oxygen or (in stage two) the diminution of SO_2.

We describe O_2 addition as a number of milliliters of oxygen per liter of wine per month (ml/L/mo). Our rule of thumb, which is not set in stone but is rather an expression of range of intensity, is that one ml/L/mo is a *barrel equivalent*, in that some recent work suggests that 1 ml/L/mo is the approximate background level of oxygen passage through oak into wine during barrel ageing.

The oxygen needs of various wines take unique pathways over time during MOx, from an initial level of 50 to 60 down to 5, and ultimately to 1 ml/L/mo when a wine is put into barrel. Each oxygen demand curve is unique, which is one reason why winemakers aren't paid minimum wage.

Enological oxygenation can be divided into five categories:

1. Hyper-oxygenation of juice to remove tannins and browning before fermentation;
2. Macro-oxygenation during fermentation to promote yeast health;
3. Post-fermentation micro-oxygenation (performed at a constant low rate slower than the wine's uptake ability so no dissolved oxygen builds up);
4. A momentary energetic oxygenation to fight reduction, polish structure and promote earlier release;

5. Sulfide treatment through low, slow oxygenation, often in concert in white wine with lees contact.

For white wine, MOx can be quite complementary. A stinky Chardonnay in the barrel can be corrected via the following technique of:

1. Temporary separation of the lees by racking and collective draining,
2. Oxygenative *quenching* of the lees by stirring them in open drums so they get plenty of air and are not allowed to form a layer of clear wine at the surface, followed by
3. Re-introduction of the *quenched* lees into the original wine when they smell wholesome.

Thus, the wine is rid of reduction, while it retains the barrel solids needed for the fattening effect of *sur lie* ageing.

A decade of use of micro-oxygenation in the cellar has taught us two lessons:

First of all, **MOx does not lessen the winemaker's work load** or diminish our need to be in intimate contact with each batch of wine. Instead, it pushes us to invest extra time early in the cycle (before and just after the malolactic period) to optimally utilize the wine' s adolescence.

Early intervention can radically curtail unpleasant surprises later encountered in the barrel. With the rearing of a child, attention given early, before a disposition becomes a problem, is more effective than remedial attention later. The same applies to a single tank of wine that ends up in 50 barrels. By increasing the workload, you increase the need for trained tasters to evaluate the wine regularly and make decisions.

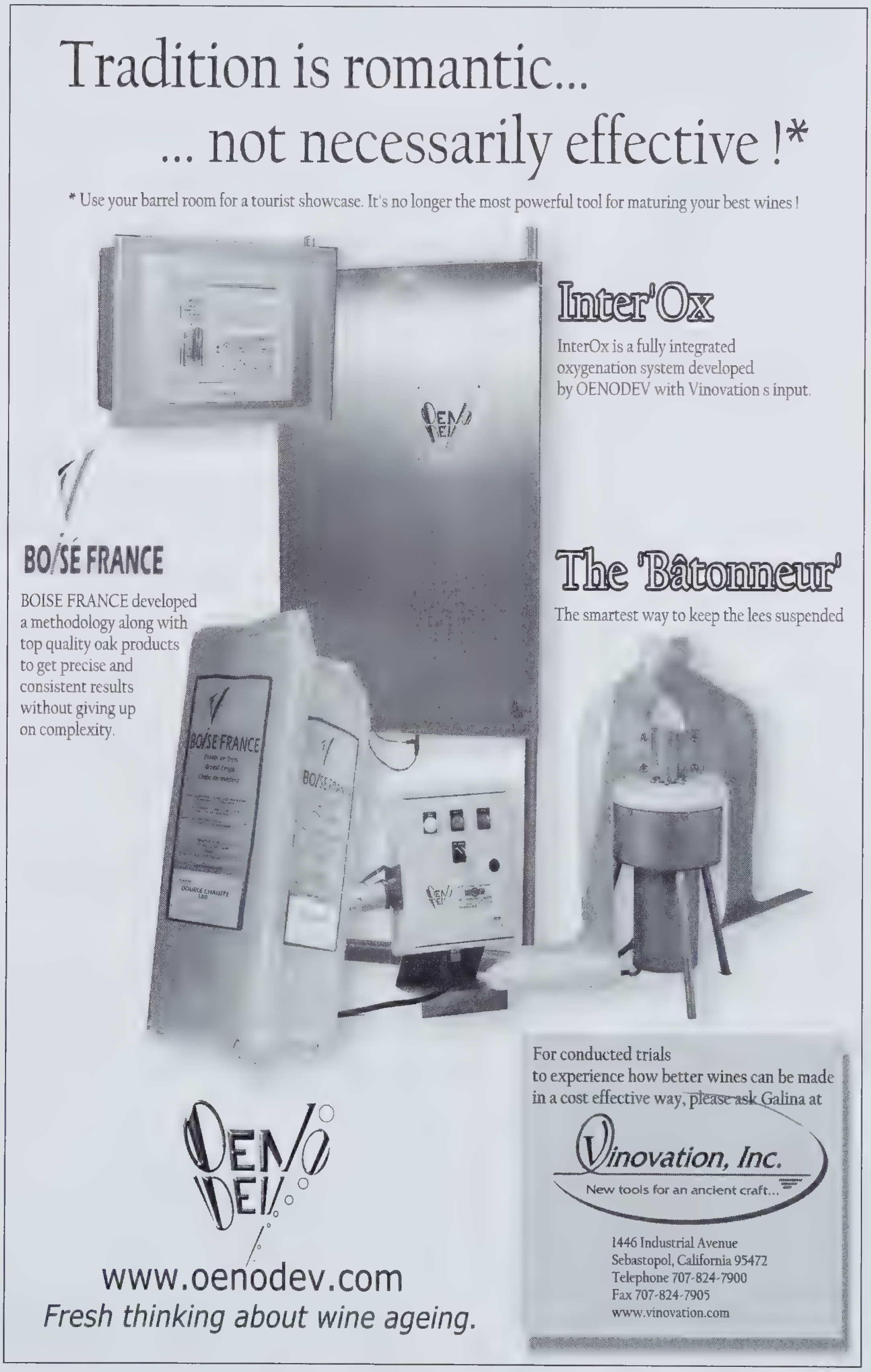
Second, MOx users should **plan on investing three to five years** in learning and incorporating the process. During the first year, the basic technique must be learned. Then its application to diverse wines and styles must be honed over another year or two, including the skill of early blending and incorporating the complexities of oak and lees management.

Only at this point can the method's full use be undertaken, the implementation of which will take some years. In addition, one will encounter vintage variations, and the evaluation process will need to follow bottle evolution over time.

Within the realm of high astringency varieties, the bigger the wine, the better MOx works. Rather than treating it as a fix for poor quality wines, micro-oxygenation has its greatest success with wines that have good structural and flavor components, yet may need some intervention to overcome obstacles to reach their potential. MOx can't create the structure where the building blocks don't already exist.

Micro-Hell solutions

Let's go back to our Micro-Hell scenarios.



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Scenario One: In Fred's winery, he'll need to improve the diligence of system use and invest more man-hours in sample gathering and analysis, or consider improved MOx automation.

While a winery is in the early stage of using MOx, winemakers should be aware that units with experimental status, which tend to be attached to mobile carts and plumbed in a jury-rigged manner, must be treated with greater care than those installed for long-term, secure use. Diffusers not associated with automated systems need to be protected from fouling by solids on the ceramic surface or from wine siphoning back into the feeder hose.

Scenario Two: Al needs to wait another year.

The main benefits of MOx (richer mouthfeel, finer and softer tannin, aromatic integration leading to less veg and more fruit) derive from creating *novel phenolic structures.* Phase one (pre-SO_2) is where 80% of the opportunity to do that exists. This requires a big shift in technique for some winemakers.

In the first weeks of a red wine's life, it will take up huge amounts of oxygen. Big Cabernets can utilize 50 to 80 barrel equivalents (ml/L/mo), and even a Pinot Noir can take 10 to 20 B.E. for a brief period.

Early color stability is the reward for MOx use. Oxygen at just the right input rate promotes tannin linkages at a time when anthocyanins can be rescued from oblivion and used to terminate short, stable tannin oligomers (5 to 10 units long).

In Al's wine, tannin evolution in the untreated wine has temporarily caught up. A temporary junction of ageing curves appears to indicate a similar destiny to the treated wine because the organoleptic natures of the two wines are momentarily in unison, despite the underlying disparity of their polyphenolic and oxido-reductive states. But the untreated wine is on a completely

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different path, and now will begin to dry out as the polymers continue to elongate.

Scenario Three: Pete still thinks sulfides are a problem, rather than a clear indicator of a wine's reductive strength.

Just as when a person works out with weights, the wine's reductive strength creates more power, not less.

* * *

Three key lessons of the last few years of MOx use are the following: First, not all wines are suited to MOx. Low tannin reds, such as Pinot Noir tend to require little oxygen beyond the quantities supplied by conventional methods, and whites are a special MOx case, which should be discussed as a separate topic.

Second, the MOx process is an ongoing event that co-exists with several stages in the wine's early life. Its use begins right at dryness, when yeast are no longer a factor in O_2 uptake in the wine. At that time, oxygen molecules generated by the MOx unit should be consumed entirely, and there should be no additional accumulation of dissolved oxygen. This continues harmoniously through malolactic fermentation, there being no inherent bacteriostatic effect of the MOx process.

After MLF, the winemaker decides to add SO_2 and thereafter significantly decreases the dose of introduced oxygen. Whereas MOx O_2 during the initial *structuring* phase (before and during MLF) was 50 to 80 times what a wine would receive in a barrel, after addition of SO_2, in the *harmonization* phase (after SO_2 has been added), the dose is generally no more than one to five times the background oxygen level of a barrel. Also, while excess oxygen early on is identified analytically by an increase in dissolved oxygen, after SO_2 addition, it is confirmed by an abnormal diminution of free SO_2.

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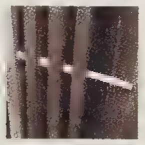

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ALTERNATIVES

Third, timing is crucial. There are currently two schools of thought about when to begin micro-oxygenation. Some feel that it is best to wait until the end of MLF, while others insist on starting earlier. It is significant that recent research — even that with a high degree of procedural rigor — consistently shows inconclusive and/or unimpressive results when MOx is initiated after MLF completion.

In contrast, a large body of decade-long observational data, gathered by technicians who know how the scientific method is carried out, show striking results by initiating MOx immediately at dryness. The initiation of MLF during alcoholic fermentation is contraindicated for a wine in which MOx is an important contributor. It is best to choose between those two practices and forego the less important of the two, based on the winemaker's priorities.

An oxygen introduction regime does **not** qualify as micro-oxygenation when it calls for a discontinuous series of short-term bubbling sessions interrupting a period of anaerobic ageing and intended to furnish a supply of oxygen lasting throughout the storage time.

MOx requires that the oxygenation be continuous and that the O_2 input be consumed by the wine without dissolved oxygen pick-up in stage one or SO_2 consumption in stage two. Those two numerical parameters serve in tandem with sensory analysis to tell the winemaker when to increase or decrease the oxygen dose. They permit the MOx process to be directed safely amidst dangers, just as road markings, a speedometer, and a steering wheel facilitate the driving of a car.

Starting MOx on a wine post-malolactic is like starting an omelet with hard-boiled eggs. The process is best begun as soon as the sugar is depleted and, if possible, well before the onset of malolactic fermentation.

The reductive nature of MLF serves as a safety net for the risks integral to MOx. All winemaking methods have unavoidable risks, and in MOx, the risk is primarily the production of excess acetaldehyde. The ideal polymerization process, in fact, requires a certain amount of acetaldehyde. Part of proper organoleptic surveillance of MOx is the assurance that the wine has enough acetaldehyde to fill the polymerization role, but not an excess that will be left over after MLF.

The low levels of acetaldehyde normal to an MOx wine are consumed by the malolactic fermentation, so one can monitor them organoleptically and watch them be progressively depleted. This permits the more aggressive approach required by our rambunctious California Cabernets and other big reds.

The circus performer can wow the audience and accept the embarrassment of an occasional spill when a net is present. When any mistake ends up on concrete, the flips and cartwheels end up as quaint hops and stately arabesques, because the practitioner

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must be far more careful than he/she would with a net. Thus it is with MOx. When using MLF as a safety net, one can expect spectacular results. When starting post-MLF, one can expect necessarily staid conservatism.

While oxygen gives us new things to worry about, it also eliminates many worries. Wines that previously seemed hopelessly harsh, bitter, vegetal, or stinky with sulfides can usually become consistently civilized. New barrel budgets can be trimmed while maintaining or enhancing quality.

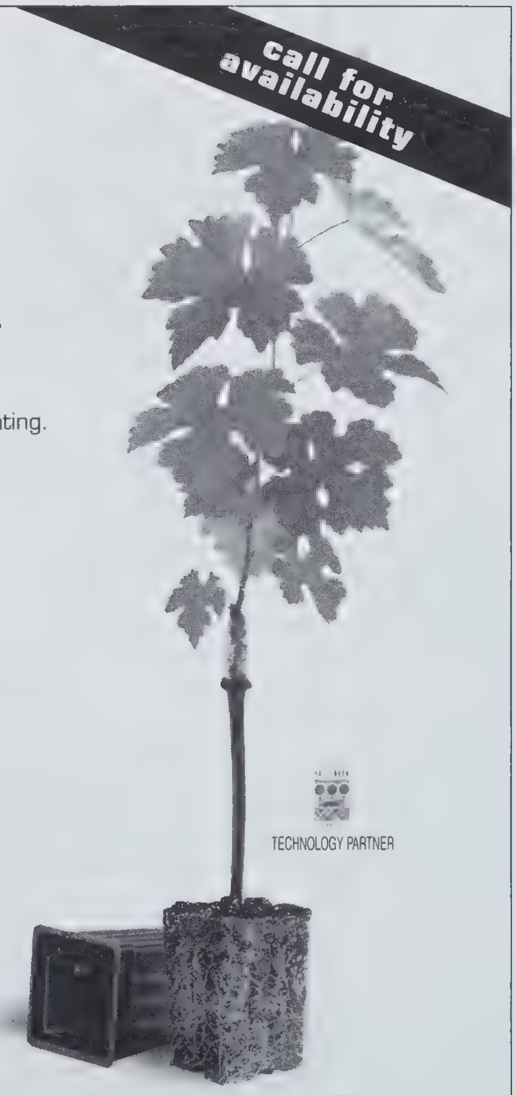
When the wines are so suited, MOx is one of the best bargains of any winery investment. But the method requires continued surveillance and attention to detail. It is the kind of cost-benefit analysis that each winery has to make as part of the budgeting process.

On one hand, the use of MOx allows you to increase quality, reduce oak costs, and reduce cellar labor costs (less racking and handling to aerate the wine).

On the other hand, you will need more skilled labor, diligent manual or automated tracking, and you'll need to purchase an MOx unit.

To make this work, you have to tailor the conceptual design of the winery, focusing on skilled employees and maximum quality consciousness. Moreover, the winemaker must be willing to accept a degree of disquiet as long as he or she is actively contradicting the modern eno-academic maxim that *oxygen is the enemy of wine.*

During the structuring phase of MOx treatment, wine should be tasted every day or two, and its dissolved oxygen level checked two or three times per week. This degree of diligence, and the wise choice of MOx-appropriate wines to begin with, makes the normal stress of MOx use worthwhile. ■



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CLOS DU BOIS VINEYARDS

ADVANTAGES OF electrostatic sprayers

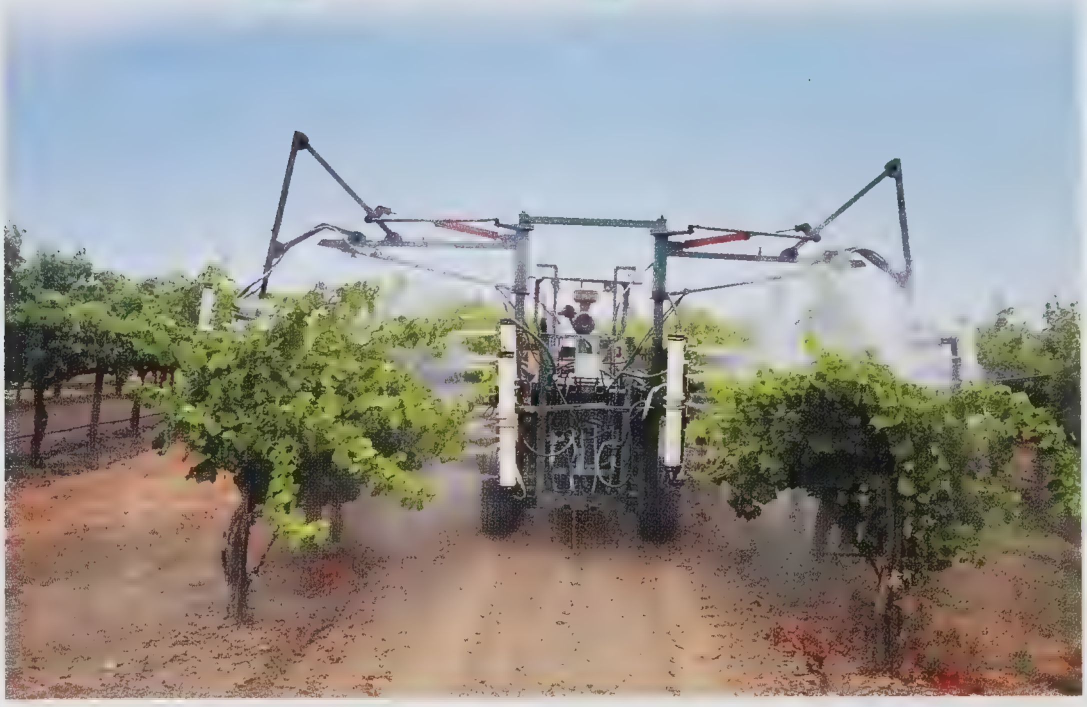

Photo by Fred Lyon

Electrostatic sprayers, like this two-row model, increase efficiency because they use less water and less chemical per acre, resulting in fewer tank refills and more time in the vineyard.

**BY Doug Price, Viticulturist
Keith Horn, Vineyard Manager
Clos du Bois Vineyards, Geyserville, CA**

In 1999, our vineyard management team at Clos du Bois (Geyserville, CA) purchased the company's first electrostatic sprayer from Randell Equipment (Woodlake, CA). The advantages of the electrostatic sprayer were reported to include a low volume of 12 to 20 gallons of water per acre, and an electrostatic charge of the spray particles, which helps minimize drift. Given the better spray coverage and the attractant nature of the spray particles, the unit also uses less chemical per acre than did previous technologies.

Our experience with the sprayer showed that it also increased work efficiency, because less time filling the tank yielded more spraying time. Also, by turning the outside spray boom 180 degrees and aligning the nozzles parallel to the cordons or canes, we were able to cover three vine rows with a two-row sprayer, or five rows with a three-row sprayer. (After our positive initial experience, we have added to our sprayer equipment, which now includes two 2-row sprayers and one 3-row unit.) This has greatly increased spray coverage on the 800 acres we farm in Alexander Valley.

As the vine canopies get larger through the growing season the spray heads are returned to their original position, with coverage of only two or three vine rows per pass. One to three early season spray-passes can be made in this manner, depending on the growing season and variety.

With the electrostatic sprayer's ability to spray two or three vine rows with full foliage in one pass, simple calculations indicate its advantages. Spraying a 26-acre block at 3-mph with a two-row electrostatic sprayer at 20 gallons per acre (gpa) requires filling the spray tank 2.5 times for a total 3.75 hours of spray time. A three-row sprayer at 20 gpa requires filling the spray tank once for a total of 2.5 hours of spray time. Compare this to a single tractor-row sprayer at 60 gpa requiring filling the spray tank 5.25 times for a total of 7.5 hours of spray time.

Another important benefit of the reduced amount of chemical used and rate of discharge is that there is less time spent mixing and filling the spray tank. This not only increases efficiency, but also reduces exposure of the spray operator/mixer loader to the concentrated form of the spray, which presents the highest health risk.

Drift issues are not dramatically different with electrostatic technology. Standard drift prevention applies when spraying with the Randell spray equipment (RSE). Close attention must be paid to weather, wind, and environmentally sensitive areas. However, with the electrostatic sprayer there is certainly less drift. By using less air pressure and having the water/spray droplets electrically-charged, the spray contacts the target with greater accuracy.

We have found that the electrostatic sprayers function well in applications that do not require high volumes of spray, such as horticultural oils, mildew eradicants, and certain miticides, as the volume of material is restricted to a maximum of 20 gpa. Attention to tank

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mixes is important to these spray programs in order to prevent problems with nozzle clogging. We find that most fungicides and wetable sulfur are compatible in a spray tank mix, but careful testing of micro-nutrient mixing, especially flowable calcium, is a critical consideration prior to spraying.

However, we also found that the usage directions from Randell spray equipment need to be followed. Clos du Bois tractor drivers flush the nozzles hourly with an adjustable rinse cycle built into the Randell sprayer.

End-of-shift maintenance is also very important. The tractor drivers spray all night, and when they finish their shifts, they are tired, so we send them home. We dedicate one person to the task of flushing, washing, and reporting any malfunctions to the mechanic of all spray rigs. This is an important step. An electrostatic sprayer not properly cared for can lead to breakdowns and downtime, which we can ill afford during the spray season.

The electrostatic sprayer is inherently more complicated than a standard pressure/air sprayer, and it requires electrical and mechanical knowledge. Attention to electrical connections and wires is key. The electrical elements of the sprayer are exposed to an environment similar to the marine environment (highly corrosive). We have borrowed some preventive elements of marine wiring by using waterproof connections with a heat shrink on all electrical connections and repairs.

Mechanically, the hydraulics and support structure are similar to any over-the-row implement; fatigue on the outside booms is exaggerated by the increased leverage of the arm. Attention to the structure is necessary. This often requires adding extra strength by gusseting welds on the booms and swing arms, and then carefully inspecting fatigue points.

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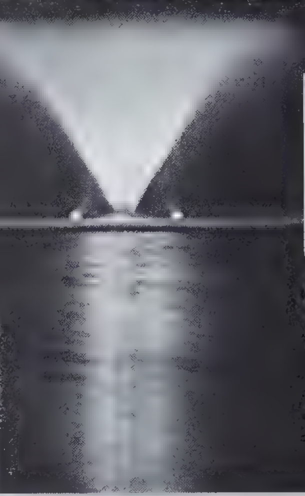
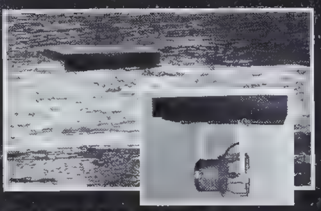
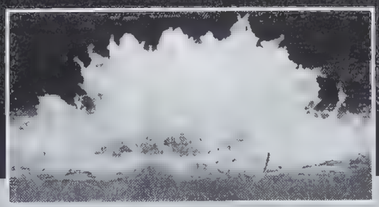
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Conclusion

Clos du Bois has found cost benefits to using electrostatic sprayers. These benefits result from reduced usage/rate of chemicals and time savings from reducing the hours for mixing and loading of spray solutions.

The use of electrostatic sprayers has allowed us to reduce the per-acre rate of early season post-bud break applications with wetable sulfur and copper sprays. Since purchase of the electrostatic sprayers, the spray quantity per acre has been steadily reduced. For early season applications, we find these rates have provided excellent protection for powdery mildew. Minimal late season incidents of powdery mildew have increased our confidence in the electrostatic spraying technology. ■

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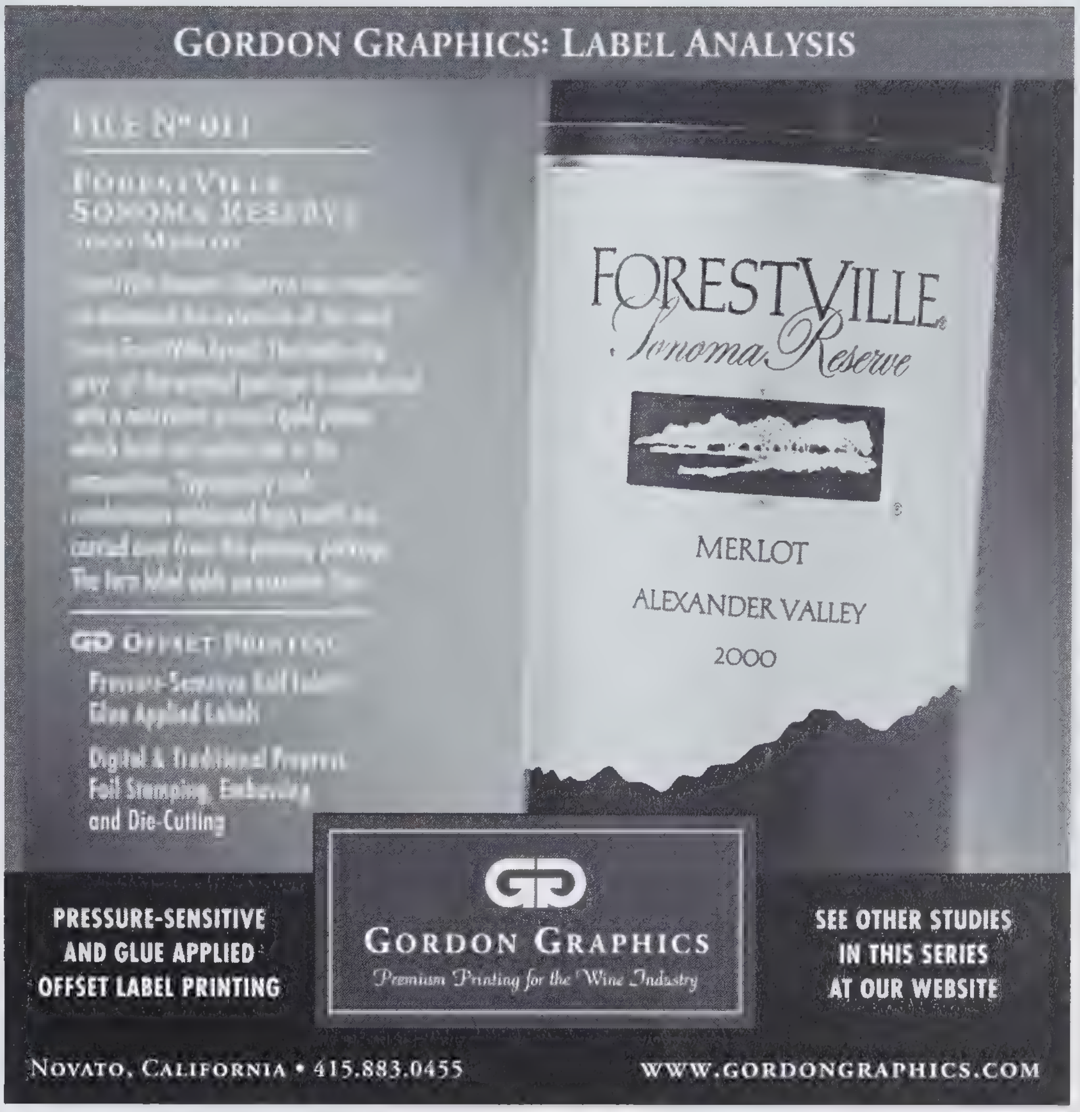

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LAND STEWARDSHIP

Dynamic vineyard management pays off

BY Eleanor & Ray Heald
Contributing Editors

For the better part of a decade, polycultural farming practices have been the norm at Wild Horse Winery and Vineyards (Templeton, CA). "We've employed the most achievable components of what has become known as sustainable viticulture," says Scott Welcher, Wild Horse viticulturist and general manager of winery operations, "and coupled them with balanced organic practices."

Welcher is a California Polytechnic State University (San Luis Obispo) graduate in fruit science, who joined the winery in 1988, became vineyard manager in 1992, and was appointed general manager in January 2004.

Wild Horse is in a unique situation with a 47-acre estate vineyard that provides 10% of the grapes for an annual 140,000 case production. Welcher refers to this acreage under vine as "an experimental vineyard."

He views "both the mistakes we've made and those things we do correctly" as a tremendous resource for growers who sell grapes to Wild Horse Winery. They ask, "What are you doing? How is it working; how is it not?" The answers help the growers improve their own grape quality, and everyone benefits.

Welcher and his vineyard team are committed to the environment and land stewardship. Of significant note is the winery's grape pomace-composting program, which complements ongoing sustainable vineyard practices and grape quality management techniques.

"Pomace," Welcher notes, "has become a huge disposal problem for wineries." In the past, the combination of grape skins, stems, and seeds left after pressing wine from fermented grapes was spread in the vineyard by some wineries. "Yet after 5 or 6 years, it still looks like pomace. It does not break down."

However, mixed with other components, such as cow, steer, and horse manure, straw, and the previous year's compost, pomace does decompose and produces a high-quality compost, which Wild Horse spreads down vine rows to provide beneficial nutrients as soil amendments, while simultaneously reducing weed growth and closing a waste loop.

"Composting is the best example of the sustainable way we close waste loops in the vineyard and in the winery," notes Welcher.

Compost program

Enhancement of site expression, reduction of outside fertilizer inputs, and solving a disposal problem are the primary goals of the extensive Wild Horse compost program.

Welcher believes that application of compost in the vineyard eliminates the

Photo by Forrest Dowd

TOP: Cards holding the eggs of predacious lacewings are placed in the vine canopy at Wild Horse Vineyards.
BOTTOM: Turning compost at Wild Horse Winery.

need for fertilizer from other sources. Organic matter brings vineyard soil into better balance and achieves better soil flocculation.

For three years before an on-site composting program began in 2002, Wild Horse transported pomace to an off-site location for conversion to compost. The compost was transported back and spread on the vineyard, in some areas as a banding operation (4 inches thick under the vine, out to 1.5 feet on either side of the vine row) and in other areas as a broadcast application.

Initially, the banding operation applied only to six experimental acres. Today, it is used on 25 acres.

Benefits of composting

"In a vineyard where herbicides have been used," explains Welcher, "soil life has been impaired. Decreased organic matter in the soil can affect vine health. Over time, with annual compost application, fulvic acid (a natural acid in compost), aids soil flocculation and nutrient uptake."

Essentially, fulvics are an artifact of lab testing. Soluble organic matter (SOM), which may include compounds derived from fulvic acid, leaches out of compost. It is readily consumed by microbes that feed soil life. Microbial exudate is the component that flocculates the soil.

In the banding application, drip irrigation is used to leach SOM into the soil. Broadcast application is best done prior to winter rain, to achieve the same goal for soluble humus components.

Welcher warns against banding if the vineyard has been planted with the graft union very low to the ground. When the graft union is covered with compost, the scion begins to root in the compost, and the rootstock will die, thus converting the vine to own-rooted.

Assembling compost components

In 2003, Wild Horse processed 3,200 tons of grapes, producing about 4% stems by weight. Prior to composting, red and white pomace and stems are kept separate and handled differently. Stems from the red destemming process are collected in one pile as a low bulk-density component. Red fermented pomace has very few stems, mostly skins and seeds. However, it has alcohol and is kept separate as a high bulk-density component.

Pomace from white grapes, pressed as whole clusters, is included in the compost pile. Since it contains a higher quantity of sugar than red pomace, it is kept separate.

The remaining white grape pomace, rather than being converted to compost, is donated to local ranchers for animal feed. "It has been a good neighbor policy rather than a cash product," Welcher explains.

Windrow architecture

Comparative bulk densities of components and carbon (C) to nitrogen (N) ratios must be considered in establishing the architecture of the compost windrow (often referred to as a pile). The components with lower bulk density are layered at the bottom to promote air circulation and reduce CO_2 accumulation.

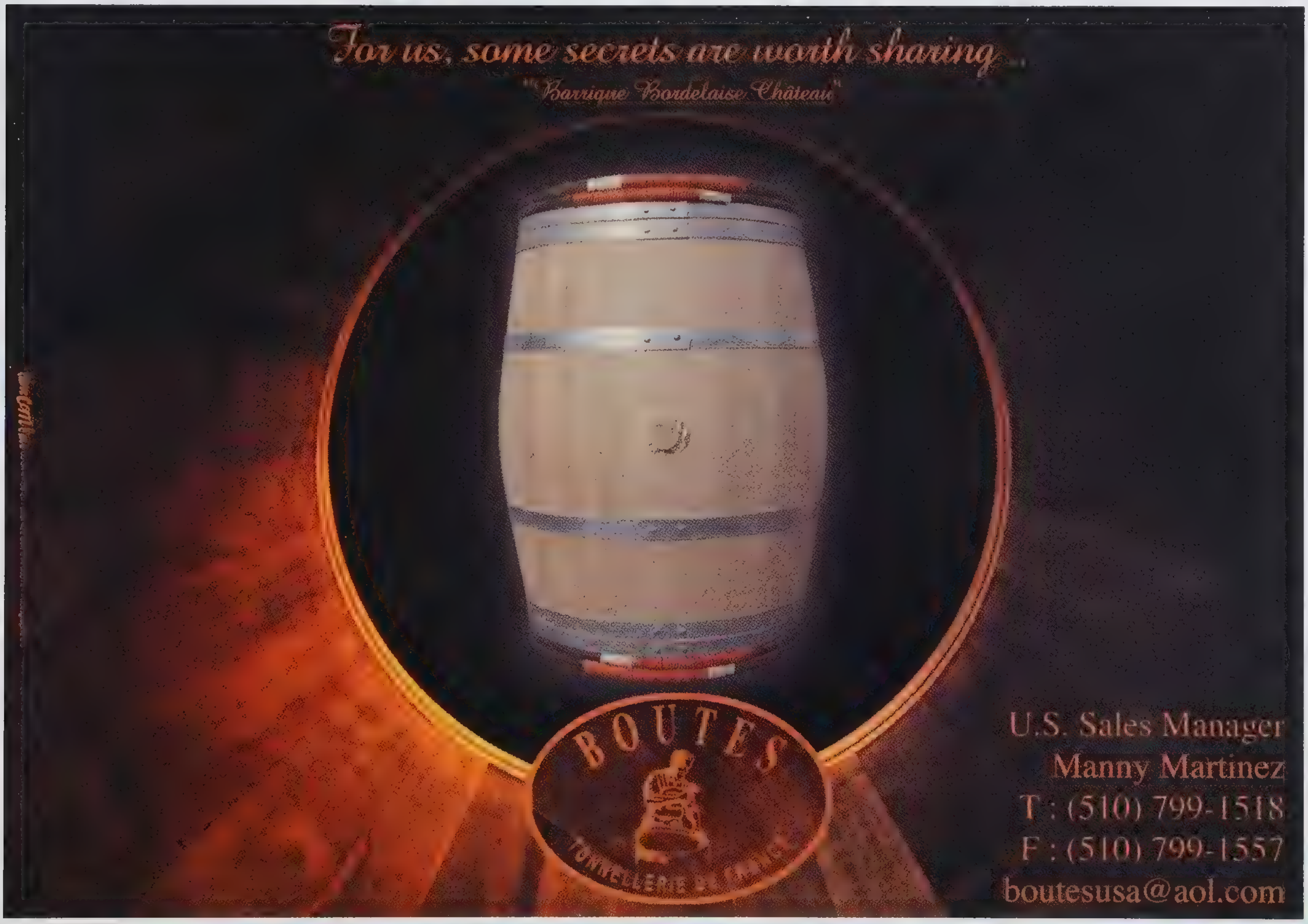
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Photo by Forrest Dowd

Scott Welcher, general manager, stands beside the used compost turner purchased by Wild Horse Winery for $14,500.

About two feet of stems are in the first layer, closest to the ground. Straw from horse farms is placed on top of the stems. Next, a layer of steer manure is placed on the pile, followed by red pomace (with any white pomace being distributed evenly throughout the pile). It is covered with Wild Horse compost from the previous year. Finally a frosting of rock dust from a local quarry is placed on top. This particular local rock dust is high in phosphorus, which acts as a natural compost fertilizer.

The windrow is allowed to rest in this condition until microbial activity occurs. During the period, it is necessary to monitor moisture content and CO_2.

When microbial activity is fully engaged (O_2 levels, after consistently rising, begin to decrease), the windrow is turned from bottom to top. In the process, stem material gets thoroughly mixed in with other components. This adds air channels throughout the windrow and aids in CO_2 dispersion. If the windrow begins to dry out, it is irrigated.

"Quality control," Welcher says, "is easily monitored visually by noticing whether or not macro particles, such as seeds, have broken down substantially."

Composting is an exothermic reaction, producing considerable heat. "Conventional philosophy now," Welcher explains, "is that temperature is not allowed to rise as high as the norm was previously.

"Old thought was to get the pile as hot as possible before turning it to sterilize the components before building up bacteria. Now, the thinking is not to allow temperatures to rise above 135°F to 140°F but to sustain those temperatures for a period of 6 to 8 weeks."

Temperature is controlled by turning the pile and by irrigating. Moisture content is measured by using the German "Faust Probe." If a handful of the compost forms a loose ball when squeezed, the moisture content is OK. If the compost does not stick together to form a ball, water is needed.

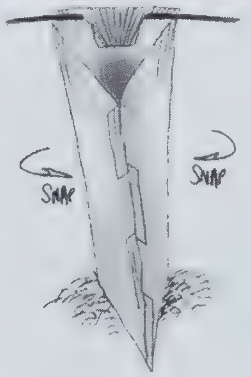
The amount of CO_2 (and indirectly O_2) is measured with a Fyrite tool that consists of a probe equipped with a small air pump, that is inserted at various locations in the compost pile to check CO_2 levels.

Gases from the compost pile are extracted through the probe via the air pump and passed through a red solution inside a metered chamber. The red solution expands as the CO_2 in the gas passing through it dissolves in the solution. The amount of the solution is then read from the scale on the chamber in percent CO_2.

Composting cost analysis

Isn't a vineyard of 47 acres too small for in-house composting?

"Not really," Welcher says. "To put 1% to 2% organic matter back into the soil, tons and tons of compost applied over multiple years are needed."



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Pomace disposal in the local Templeton landfill costs $45 per ton.

Purchased high-quality compost runs $30 per cubic yard and higher. A typical broadcast application is 4 to 5 tons per acre. Wild Horse began experimenting on 6 acres. Banding requires an application 3 feet wide and 4 inches high across six acres. "Do the math," Welcher suggests, "and in-house composting pays off."

Wild Horse purchased a used compost turner for $14,500 and hires a company with a spreader and crew to spread the compost.

Depending on annual requirements, with each year being different, Welcher estimates the cost of buying fertilizer, compared to making and spreading compost, can range from zero dollars to several hundred dollars per acre.

The following production costs at Wild Horse are based on 550 cubic yards of finished compost:

Labor (windrow setup, turning, monitoring, and repiling after completion), 220 hours at $10 per hour plus overhead = $3,000.

Loader rental with operator, 120 hours at $75 per hour = $9,000. Other compost materials (manure, straw, and rock dust) including trucking = $1,500. **TOTAL** inputs of $13,500 per 550 yards finished compost = $24.50 per cubic yard to produce.

Assessing benefits

Soil analysis of N, P, and K after one year showed signficantly higher levels than corresponding blocks where compost was not applied.

With a compost turner equipped with an irrigation bar and a separate inoculation bar, Wild Horse has the ability to spray other nutrients into the compost.

"Although doing this through the drip system is a more direct approach," Welcher notes, "the point is that if there's something that the material needs in order to compost properly, the option exists to incorporate it directly into the active compost pile."

Other techniques

For a couple of years, Welcher used a remote-controlled miniature airplane, with a wingspan of four feet, to release beneficial predacious insects over the vineyard. "The application is cutting edge, and we're sorry that we had to drop it," Welcher says. "We were unable to come to terms on cost with the supplier."

Today, beneficial insects are introduced manually into the vineyard. Predatory, or "good" mites come on bean plants (about 10,000 mites per 300 bean plants), placed strategically throughout the vineyard based on vine spacing. Predatory mites run off the bean plants onto grape leaves and vines, and begin feeding on spider mites and their eggs. The release rate per acre depends on the pest pressure and vine spacing, but an average release rate is between 2,000 and 5,000 mites per acre.

Additionally, lacewing eggs are distributed in the canopy. Lacewing egg "cards" (4 inch by 8 inch index cards) are provided by an insectary, with 30 perforated tabs per card. Each card contains 5,000 to

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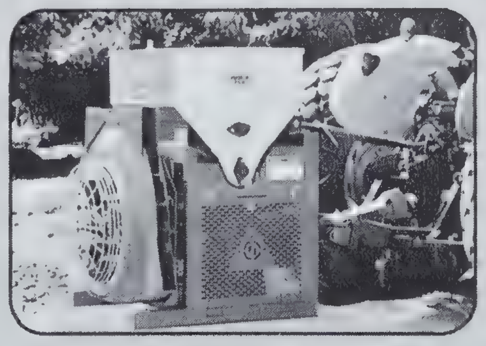

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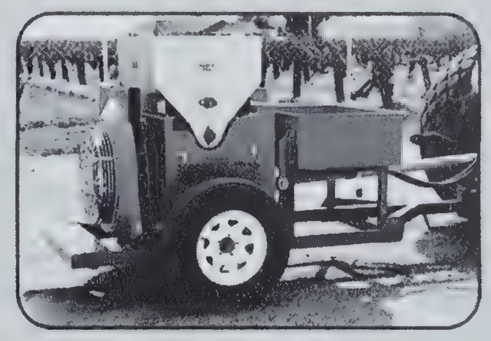

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10,000 lacewing eggs, secured with organic adhesive. While the adhesive is wet, the card is also covered with dead moth eggs. The moth eggs serve to fill in the space on the cards, and are food for hatching lacewing larvae.

One of the 30 tabs from the card is attached to a leaf petiole. Hatching lacewings first eat dead moth eggs on the card, and then go after mites, aphids, and other insects.

In response to the ineffective and noise-polluting traditional paramilitary maneuvers for bird abatement, Welcher initiated a different solution. He encouraged two California engineering and manufacturing firms to fabricate a mechanized system for spreading protective netting over the vines. The Net Master® crop protection system, for which Welcher is a co-inventor, is capable of applying or recovering netting over an acre of vineyard in 30 minutes.

Welcher reports the cost amortizes to $100 per acre over a period of 10 years.

Owl boxes (for gopher control) may not be cutting edge, but Welcher states: "How would you like to have someone who works for you 24/7, no complaints, no overtime, and does a hell of a job?"

The wine industry has become a popular target for criticism of the amount of water used in a vineyard and winery. At Wild Horse, process wastewater is recycled in two aeration ponds that maintain a healthy aerobic bacteria digestion of winery wastewater. Recycled process water is then combined with well water and used for irrigation of the vineyard property.

Last drop

Looking back over his 15 years at Wild Horse, Welcher is pleased with the sustainable path he has chosen and the outlook for the winery's future.

"For Wild Horse," he concludes, "the methods for composting have closed waste loops and make beneficial products from waste. Second, a technique such as wastewater recovery for vineyard use speaks to managing resources more efficiently.

"In the long run, our practices have allowed us to be more sustainable stewards of the land. I'm getting a satisfactory answer to the question: Can I leave this place better than when I came here?

"In addition, a vineyard and winery must be a good neighbor to include something as important as netting the vineyard with the Net Master® instead of using noisy propane cannons, moving to mechanical weed control methods instead of a pre-emergent herbicide program, or using beneficial insects instead of insecticides.

"Most important, implementing and using sustainable farming practices will ensure a more viable long-term philosophy to the health of the vineyard, the quality of the wine produced from those vineyards, and the well-being of the community." ■

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WINE MARKETING

Enhancing tasting room service to *drive* revenue

Photo by Fred Lyon

The 1,200-square-foot Provenance Vineyards' tasting room (St. Helena, CA) features a 36-foot long tasting bar. Flooring is made with used barrel staves.

BY Liz Thach, Ph.D.,
Janeen Olsen, Ph.D.,
Sonoma State University,
Rohnert Park, CA

Given increased global competition and marketing in the wine industry, many wineries have been driven to investigate new sales channels. Wine clubs, special events, and Internet marketing are just a few of the methods they have employed to boost revenues in recent years. Some wineries have chosen to focus their efforts on the tasting room.

Traditionally, wineries have tended to view their tasting rooms as a necessary overhead expense, maintained primarily for public relations and brand exposure purposes, rather than as a serious source of wine sales.[21,22] However, as new wine labels continue to flood the market, capturing the attention of distributors has become even more challenging than it was in the past. This has resulted in an increasingly creative approach to direct consumer marketing.

Continued consolidation of the distributor ranks has exacerbated the situation, so that direct wine marketing often becomes the only solution for smaller, start-up wineries. Even large wineries are beginning to look more favorably on tasting-room sales possibilities. Indeed, even some large global wineries are working with their distributors to develop partnerships that will allow them to promote more sales in the tasting room, while not undercutting the sensitive price/quantity relationships they have with distributors.

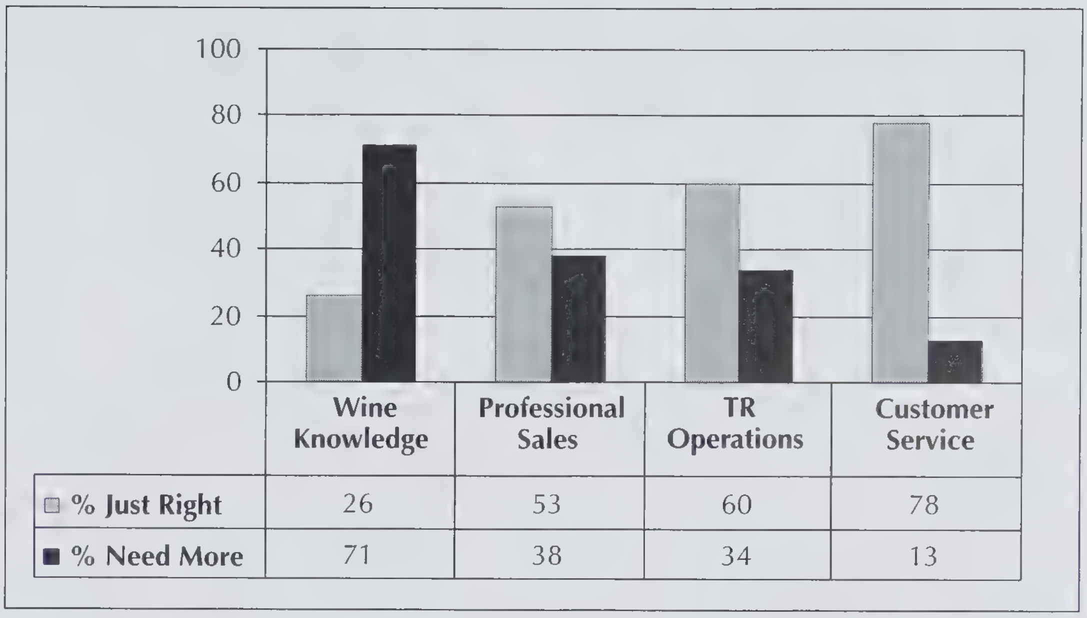
Given these dynamics, sales and customer service within tasting rooms have come into the spotlight. The consumer's tasting-room experience is instrumental not only to sales there, but also to sales when the customer returns home and looks for the wine label in a local store. However, recent reports of poor tasting-room service have put the U.S. wine industry on alert. The industry has identified this critical area as one in which more training is needed.[6,10,22,29]

Return on investment

Research has now proven that the upfront costs of training employees can be recouped in improved efficiency and higher quality. Training has been shown to be especially useful in situations in which pre- and post-metrics can be tracked, such as sales figures, average transaction, production quotas, and so on.[1,15,18,27]

Several metrics can be used to track tasting-room effectiveness. These include the bottle or case units sold, total revenues, margin, number of return customers, number of new customers, and wine club sign-ups.[4,20] Though a customer's purchasing decisions are based on multiple factors, many actions of the employee do impact these metrics.

Examples include engaging customers in dialog about their wine and food preferences; subtly selling the wine club; mentioning special case discounts; and up-selling. It is for these reasons, that effective training on customer service and sales in tasting rooms can help improve profitability.[8]



	Wine Knowledge	Professional Sales	TR Operations	Customer Service
□ % Just Right	26	53	60	78
■ % Need More	71	38	34	13

Chart I: Types of training desired by tasting room employees

Research study

Based on the issues identified above, our research study was designed to examine perceptions of tasting-room employees regarding the type and amount of training they receive. A questionnaire was developed and distributed to 80 tasting rooms in California, of which 61 returned surveys that were usable (39 from Napa and Sonoma wineries, and 22 from other regions of California.)

Surveys were returned by individuals from the tasting rooms surveyed. Each tasting room was sent three questionnaires. Because of the anonymity promised to respondents, it is not possible to track the number of wineries that participated. The survey methodology used random selection of wineries through a random number table. The list used to generate the sample was the *California Visitor Review.*

While random selection of sampling units with a multiple, but equal, number of questionnaires for each one is an acceptable procedure for survey research, the sample size cannot be assessed, and hence, a margin of error associated with the survey is not reported. Any inferences to the general population should reflect those of training room staff as a group, not those of tasting rooms, such as 12% of tasting-room staff, not, 12% of tasting rooms, yet, as with any survey research, questions of validity remain.

The questionnaire addressed the 10 most common training needs for tasting-room employees, grouped into four competency areas, described below. These were determined through a review of the literature and expert opinion and were based on customer feedback via mystery shopping. (Before any research study is developed, we do a thorough review of what has already been published in the literature, then we design a survey based on those findings. Then, we beta-test the survey to make sure it works; then administer it.)

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1. Basic wine and product knowledge — Basic wine knowledge is critical for effective performance of tasting-room staff.[13,22,24,33] This includes knowledge of basic viticulture and winemaking, the major grape varietals, American Viticultural Areas, and tasting terminology. Also key is knowledge about all the wines and major merchandise sold within the tasting room.

2. Customer service — Training in personalized customer service and "reading the needs knowledge level" of the customer is also important.[24] Tasting-room employees need to learn basic questions to ask in order to determine the customer's knowledge level and/or interest in wine tasting.[24] Some customers want detailed information on winemaking techniques, while others merely want to taste and talk about food/wine matches.

From our literature review, we learned that it is important for tasting-room employees to avoid "intimidating" novice wine drinkers with unnecessary information. They need to customize their service to the visitor's needs.

The employee's goal should be to create such an enjoyable experience that customers will become life-long customers of the winery, and will encourage their friends to visit also.[7] Anecdotal data suggests that the longer guests stay on a property, the better the brand experience, resulting in brand loyalists who support the brand in future buying decisions.

3. Professional sales — After wine and customer-service knowledge, skills training in professional sales is necessary. Many wine tasting-room employees are friendly and knowledgeable about wine, but after conducting the tasting and chatting, they don't ask for the sale.[6,22,33] Instead they "hope" the customer will buy because they had a nice experience.

More professional, yet not pushy, sales skills are needed to enhance profitability within tasting rooms. Knowledge of food and wine pairings with the intent of helping a customer select the correct wine is part of this need. Related to this are skills in upselling for both wine and merchandise, and skills for promoting the wine club, upcoming events, the newsletter, and the Internet site (if available). Finally, there should be training on how to promote any specials or discounts that are available within the tasting room.

4. Tasting-room operations: Other important training skills for tasting-room employees revolve around some of the basic operations in the tasting room. This includes how to serve and clean-up the wine; operating the cash register (if necessary); and providing information on where the customer can buy the wine at home. This category also includes dealing with diffi-

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cult or intoxicated customers, giving tours, and promoting local restaurants and other tourism sites (including other wineries).[22]

Survey results and implications

Figure I reports the level of training tasting-room employees say they need. Participants were asked to rate their perception of the amount of training they received in 10 sub-categories that make up four competencies. Choices were: "Need Less," "Just Right," "Need More," and "Not Sure." Since responses in the "Need Less" and "Not Sure" categories were all under 7%, they were omitted in Table I.

These results indicate that the primary training need identified by employees in the sample was wine knowledge, with 71% reporting they needed more training in basic wine and product knowledge, winemaking methods, and grapegrowing techniques.

The employees may want to feel more confident when speaking with sophisticated wine consumers who visit. Management requires employees to have this additional knowledge before they can move up to the reserve tasting rooms where more time is spent with visitors on an individual basis. Having employees who are able to provide the information that sophisticated wine consumers seek is more likely to lead to more sales of premium wines and a better overall image of the winery.

Respondents also indicated a need for more training about different wine types. In order to differentiate themselves from the crowd, many wineries produce unusual varietals or styles of wines. Many of these wines may be produced in small lots and are only available from the tasting room. The better informed the tasting-room staff are about these different wines, the better they will be able to sell them to visitors.

The second most often cited training need was for professional selling, with 38% of respondents stating they needed more. This is heartening, because there have been reports of tasting-room employees not "wanting to do sales." However, professional selling is quite different from traditional "sales."

In professional selling, the tasting-room employee engages customers in a conversation about their needs, and attempts to find a product to match those needs. Traditional sales is more "hard sales" — trying to push a product on a customer. Professional selling is attempting to understand the customers' needs **first**, and then explaining how your product fits those needs. Also, it includes up-selling, and focusing on the complete "customer experience" to insure it is positive.

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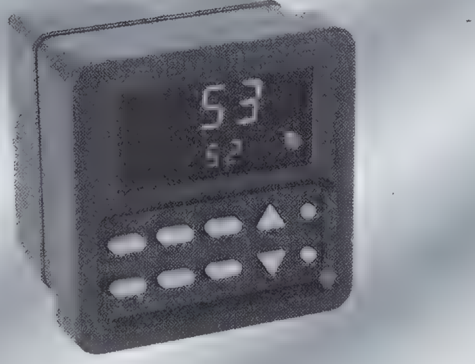

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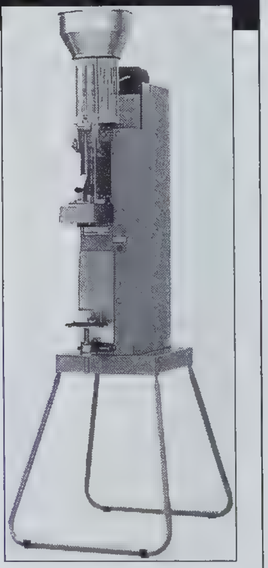

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We found that many tasting-room employees perceived sales as only "hard/pushy sales" and were not aware of the concept of professional selling. Many perceive the concept of "sales" as a bad thing.

For example, all specific discussion of food-wine pairings should be based on a customer's self-identified needs. Saying a particular wine "goes great with steak" is of no value to a vegetarian, so the wise tasting-room employee asks enough questions of his or her visitors to discern their needs and preferences before making any suggestions. With proper training and background, the employee can make specific recommendations for wines to enhance vegetarian entrees.

Regarding tasting-room operations, 34% of respondents said they need more training. In further questions, respondents rated their need for training in three major components almost equally:

- Conducting tastings (including operating the cash register);
- Handling difficult customers;
- Making referrals to local restaurants and hotels.

Finally, customer service does appear to be emphasized in training programs, as 78% of employees reported that they are satisfied with the amount of training they receive in that category. This may be because the traditional tasting room was set up primarily for public relations reasons, and pleasing the customer (not sales) has been the main objective.

However, despite responding employees' self-reports of adequate customer-service training, widespread reports of bad service suggest an ongoing need for training. Just a few rude or unfriendly employees are all it takes to ruin the reputation of a winery tasting room, convincing visitors never to return and to keep their friends from coming also. Because of this, wineries need to make sure they provide a ***consistent*** level of training for ***all*** tasting-room employees — not just full-time employees.

Table I: Frequency of tasting room training

Never	Only on Starting Employment	About Once a Year	About Once a Month
20%	12%	26%	42%

Format and frequency of training

Other tasting-room issues include when to have training; the preferred format (self-study, classroom, mentor, etc.); and how often to hold training.

Our review of the literature and survey respondents agree that tasting-room training should be held every six to eight weeks and can include such novel formats as tastings with the winemaker, visits to other wineries, and

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food/wine pairings.[33] Both written and verbal instructions should be provided on key customer-service issues, and new tasting-room personnel should be matched with more seasoned employees who can act as mentors.[22]

We also suggest that employees receive a policy and procedures manual upon hiring and that tasting rooms hold monthly staff meetings to update current issues and taste and discuss newly-released wines.

Table I has survey results on the frequency of tasting-room training. On a positive note, it appears that 42% of employees are receiving some type of training at least monthly. However, rather alarming is that 20% of employees never receive any training. This should raise management concerns about the potential negative impact this could have on sales revenue.

Demographics and salary information

The survey gathered information on the demographic make-up of the 61 participants, along with salary levels. The reported education level of participants was quite high, with 27 having some college experience, 20 being college graduates, and nine having graduate degrees.

Sixteen respondents had retired from a previous career, and many were working in tasting rooms because of their "passion and interest in wine." In this particular sample, 16 were male and 45 were female, ranging in age from 21 to 68, with a median age of 43.

More than half the sample (60.7%) worked part-time — fewer than 40 hours per week — with a median of 30 hours. Seventeen had other jobs in addition to the tasting room. The average hourly wage was $11.06, ranging from a low of $7 to a high of $18.

There was no correlation between how long the employee had worked for a winery (or in the wine industry) and salary. There was a positive correlation ($r = .466$, $p = .00$) between salary and how many hours an employee worked in a week, indicating that full-time employees are paid significantly more than part-timers.

Almost half the sample (29 respondents) had worked previously at another winery tasting room. In all, the respondents had spent an average of 6.23 years working in the wine industry in some capacity.

Overall satisfaction of tasting-room employees

A final category of the survey covered satisfaction level not only with tasting-room training overall, but with salary, benefits, and scheduling. Table II illustrates the results in this category.

(Data illustrates the number of employees responding to each category.)

Scheduling

Overall, it appears that most employees in the sample are either neutral or satisfied with the winery's training program, but only seven respondents were "very satisfied." On a scale of 1 to 5, the mean score for satisfaction was 3.37. This suggests that while most tasting-room staff members do not consider training programs a negative job factor, neither do they consider such programs outstanding.

Based on our analysis of the survey responses, there is a lot that could be done to improve winery tasting-room training to meet the needs of employees and improve overall job satisfaction.

Satisfaction with salary, benefits package, and scheduling was also surveyed, with means of 2.91, 3.21, and 3.90 respectively. Intriguingly, there was a positive correlation between satisfaction with training and satisfaction with the salary, benefits, and scheduling ($r = 0.27, 0.35, 0.29$, $p = <0.05$). This suggests that wineries

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that take the time to implement good training programs are also concerned with other employee-satisfaction issues, such as fair pay, benefits, and flexible scheduling. This bodes well for wineries of this type, as research in other industries has proven that companies with higher levels of employee satisfaction also have higher levels of customer service and resulting revenues.

Other tasting-room profitability issues

It is important to note that there are a few other tasting-room issues that can impact profitability. These include having enough employees available to handle both small and large customer crowds, and ensuring that the physical appearance and layout of the tasting room is conducive to sales.[33] This includes tasteful decor, signage, clean grounds and facilities, and size of tasting bar.

Table II: Satisfaction level of tasting room employees
(Data illustrates the number of employees responding to each category)

Satisfaction	Very Unsatisfied (1)	Unsatisfied (2)	Neutral (3)	Satisfied (4)	Very Satisfied (5)
Training	4	7	19	24	7
Salary	4	24	7	25	1
Benefits	4	12	15	22	5
Scheduling	4	4	5	29	19

In addition, retail merchandise should support the winery brand image, such as cookbooks, dishes, pots, spices, and other items to support a brand image that promotes food with wine, or selling Italian pottery if the winery promotes Italian wines and architecture.

Finally, one traditional piece of advice in the training industry is to hire the right type of employee to provide customer service in the first place.[27] This holds true in the wine industry as well — wineries should establish a selection program that screens for tasting-room employees who enjoy talking to people about wine.

Conclusion

It is apparent that ample opportunities exist to conduct additional research in the areas of tasting-room customer service, training, and profitability. The results of this study illustrate that wineries have recognized a need for training, but that specific topics still need additional emphasis.

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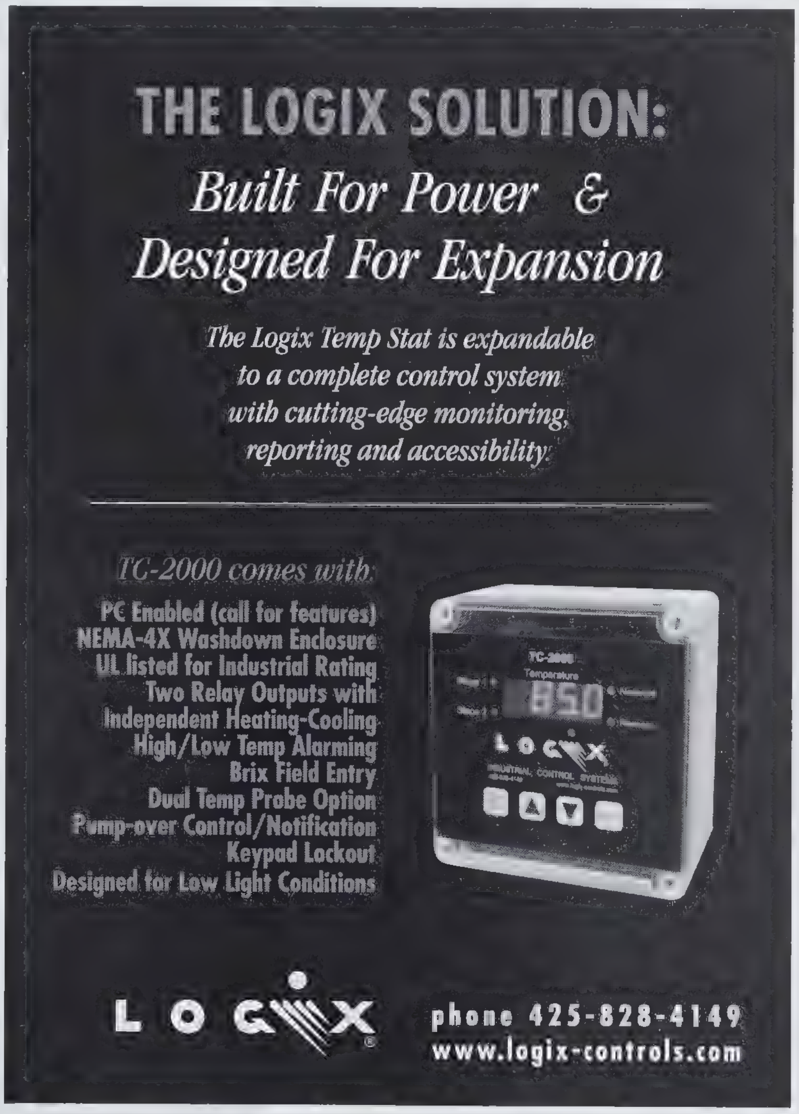

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While employees appear to recognize the benefits they receive from training programs, wineries have an opportunity to enhance training and make it more satisfying for staff. That may ultimately allow wineries to achieve higher sales revenue in tasting rooms. ■

References

1. ASTD (2002). *Training for the next economy: An ASTD state of the industry report.* American Society of Training & Development, Alexandria, VI.

2. AVA, American Vintner's Association, (2002). Website. Available at www.americanwineries.org

3. Barrows, C.W. (2000). "An exploratory study of food and beverage training in private clubs." *International Journal of Hospitality Management*, 12 (3), 190–197.

4. Barclay, V. (2001). "Successful marketing plan components." *Practical Winery & Vineyard*, July/August.

5. Billingsley, K.L. (2002). "Meet the new wine racket: Same as the old?" *Consumers' Research Magazine*, 85 (11), p. 13.

6. Cartiere, R. (2001), "Tasting rooms need to embrace professional customer service." *Wine Market Report*, November 16, 4 (75), p. 1–2.

7. Demsky, A. (2001). "The new tasting rooms get personal." *Wine Business Monthly*, April 8 (4).

8. Essex, D. (2002). "Study says employee training increases company ROI." Available at http://www.idg.net/english/crd_training_888432.html

9. Folwell, R.J., and M.A. Grassel (1995). "How tasting rooms can help sell wine." Available at http://ag.arizona.edu/arec/pubs/dmkt/HowTastingRooms.pdf. Originally published in *Rural Enterprise* (Spring 1990).

10. Gaiter, D., and J. Brecher (2002). "Napa, Sonoma offer tours with or without the crowds." *The Wall Street Journal*, July 12, www.wsj.com.

11. Hall, L.S. (2000). "Learning more about wine enhances any wine-related employment." *Wine Business Monthly*, July, 7(7).

12. Hall, J., and M. Winchester (2000a). "What's really driving wine consumers?" *Wine Market Supplement*, Vol.15 (4), P. 68–72.

13. Hall, J., and M. Winchester (2000b). "Focus on your customer through segmentation." *Australia & New Zealand Wine Industry Journal*, Vol. 15 (2), P. 93–96.

14. Hall, J., and M. Winchester (1999). "An empirical confirmation of segments in the Australian wine market." *International Journal of Wine Marketing*. 19–35.

15. Keenan W. (2000). "Sales training ROI?" *Industry Week*, 249 (11), p. 23.

16. Madigan, A. (2002). "Taste the wine, buy a t-shirt at Palandri." *Australia & New Zealand Wine Industry Journal*, 17 (2), p. 78–79.

17. Montana Wines (2002). "Induction and training: Investing in the development of people." Available at http://www.montanawines.co.nz/Pages/profile/training.html

18. Montesino, R. (2002). "Strategic alignment of training, transfer-enhancing behaviors, and training usage: A post-training study." *Human Resource Development Quarterly*, 13 (1), p. 89–108.

19. Montroy, P. (2002). "Créme de la créme de la wine. How wineries serve the ultimate premium market." *Sonoma Business*, August, p. 44–49.

20. Penn, C. (2001). "Managing the tasting room." *Wine Business Monthly*, April 8(4).

21. Prial, F.J. (2001). "There's a genie in the cellar." *New York Times*, 150 (51769), p. D1.

22. Quackenbush, J. (2001). "Wineries see tasting rooms pour up handsome profits." *Wine Industry Business Journal*, November 16, p. 13–16.

23. Root, C. (1996). "Improving your tasting room: Treatment of general public visitors." *Practical Winery & Vineyard*, May/June, p. 1–4.

24. Rosti, Jr., R.T., and F. Shipper (1998). "A study of the impact of training in a management development program based on 360 feedback." *Journal of Managerial Psychology*,12, p. 77–89.

25. Salopek, J. (2000). "Grape expectations." *Training & Development Journal*, August 54(8), p. 54–59.

26. Spawton, T. (1991). "An introduction to the wine economy and state of wine marketing," *European Journal of Wine Marketing*, 25(3), 6–48.

27. Stone, W., and V. Watson (1999). "Measuring training ROI & impact." Available at: http://216.219.224.241/measuring_training_roi_and_impac.htm.

28. Sunoo, B.P. (2001). "Results-oriented customer service training." *Workforce*, 80 (5), p. 84.

29. Tinney, M.C. (2002). "Tasting room sales: How much has changed since September 11?" *Wine Business Monthly*, May 9(5).

30. *Vineyard & Winery Management* (2003). Tasting Room Profitability Seminar. Available at http://www.vwm-online.com/Events/TastingRoom/TR2003 schedule.htm

31. Walker, L. (2002). "Tasting room survey: Selling at the cellar door." *Wines & Vines*, November. Available at http://www.winesandvines.com/feature_nov_02_tasting.html

32. Westone (2001). "Cellar door salesperson". Available at http://getaccess.westone.wa.gov.au/careers/profiles/data/OCC250.asp

33. Wine Market Council, (2000). "Wine market 2000: Trends and analysis." Published by the Wine Market Council, Greenbrae, CA, Oct. 1.

34. Winter, M. (2001). "Is your tasting room ready for the crowds?" *Wine Business Monthly*, April, 8(4).

35. Becker, B., J. Huselid, & D. Ulrich (2001). *The HR Scorecard*. Boston: Harvard Business School Press.

36. Yeung, A.K., & B. Berman (1997). "Adding value through human resources: Reorienting human resource measurement to drive business performance." *Human Resource Management*, 36 (3), p. 321–335.

37. Ulrich, D. (1997). "Measuring human resources: An overview of practice and a prescription for results." *Human Resource Management*, 36 (3), p. 303–320.

38. Davison, B. (2003). "Reviewing corporate financials show how HR measures up." *Employee Relations Today*, Spring 2003. Available at www.interscience.wiley.com.

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Lyrique du Rhônely Hearts?

Something's always up at Bonny Doon Vineyard, and January saw the latest caper under the big top at Teatro Zinzanni in San Francisco, CA. Ostensibly, the show was to introduce the 2002 Cigare Volant, Bonny Doon's screw-capped Rhône-style red wine. Priced above $30, with more than 10,000 cases, Cigare Volant is the latest convert to the winery's screw-capped wine packaging, begun in 2003.

Truth is though, the wine was nearly lost in an extravaganza that winery marketers and marketeer-extraordinaire Randall Grahm called "Born to Rhône," with a rock opera that "followed the life and times of our founder and president for life," the aforementioned Grahm.

Part circus, part theater, part restaurant, and all fun, Teatro Zinzanni staged the show, which was "punctuated with songs dedicated to many of our 30+ wines." Grahm wrote the songs, which — more or less — fit the melodies of pop songs that most Baby Boomers hold dear. Zinzanni performers dressed — or undressed — to match the honored wine's label and belted out "Vin Gris" to the tune of the Who's "Born Free" and "Monster Grenache," which claimed to be a "vineyard smash," to name two.

The 300 guests enjoyed a great party and went home with a book of the tunes styled after a revered album cover and called *Bouteille: Chateauneuf-du Papers Rhônely Hearts Club Band*. It seemed like too much fun to keep to ourselves, so here are some samples. You won't have any difficulty humming along.

—Carol Caldwell-Ewart

Lyrics by Randall Grahm

Born to Rhône

sung to: *Born to Run* (Bruce Springsteen)

In the day we sweat it out in the cellar with a Rhône-away eclectic crew
At night we sit through Winemaker Dinners with suicidal menus
Spring rolls from fusion cafes out on Highway 9,
Taiwanese vinegar, umami-injected and steppin' out all over the wine
Pairing wine with honey-glazed ribs is a knack
It's a food/wine pairing trap, it's a vinous suicide, a Hoisin veggie wrap
We gotta stop trying to pair Egg FooYung
'Cause champs like us, baby we were born to Rhône

Laube, let me in, I wanna be your friend
I want to shape your dreams and visions
Just wrap your palate 'round some Pacific Rim
And bear with me for my constant derision
Together we'll join a bacchante, dare to decant
We'll taste Rhônes till we drop,
baby we'll never recant
Will you walk with me out to the telegraph wire
'Cause, Laube, I'm just a scared and lonely Cigare flyer
But I gotta find out how it feels
I want to know if the rootstock is wild
Dude, I want to know if terroir is real

Thanks to Kermit and Alice, stemmy
Côtes du Rhônes are served at Boulevard
Kolm and Tanzer are rearguard reviewers
And the *sommeliers* push young cabs so hard
The *amuse-guelle* course rises suddenly in my gorge
Kids are muddled over bongs drinking Arbor Mist
I wanna drink 'real' wine with you, Laube,
some '64 Lafite tonight
In an everlasting dis.

The wine biz is jammed with Central Valley syrah on a last chance power drive
Everybody's jumping on the Rhône bandwagon
But there's no way a hack wine could survive.
Together, Laube, we'll uncover the badness
I'll share with you all the madness of my protocol
Someday, dude, I don't know when
we're going to make a Cigare that really expresses *terroir*
And we'll weightlessly walk on moonstones
But till then champs like us
Baby, we were born to Rhône

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RHÔNELY HEARTS
CLUB BAND

Easy to Make Chard(onnay)

sung to: *Easy to be Hard* (from Hair)

How can critics be so clueless?
How can critics be so cruel?
Easy to make chard
Easy to ferment cold

Oh, how can critics have such rudimentary tastebuds?
How can they be fooled by a new wood?
Easy to make chard
Easy to malo

And especially critics
Who laud Ricardo Cotarella
Who care only about low yields
And a hedonistic experience
Do you only care about gobs of fruit?
How about a leading blend?
I need a blend

How can wines be so soulless?
You know I'm hung up on *gout*
Easy to pick late
Easy to r.o.

Oh, and especially critics
Who care about 'concentration'
Who say they care about
depth and complexity
Do you only care about
fining and filtration?
How about a leading blend
I need a blend

How can critics have no tastebuds?
How can they be fooled by new wood?
Easy to be make chard;
Easy to ferment cold
Easy to make chard.
Easy to malo.

Oakville, California

sung to: *Hotel California* (the Eagles)

On a wine country highway,
warm wind in my hair
Warm smell of *baguettes* and *chevre*,
rising up in the air
Up ahead in the distance I saw a cute grocery
We were all running low on basil-infused oil
And I had to stop for a pee

The server was quick to pour me
The taste of hard tannins and hard sell
And I was thinking to myself,
'This could be tourist heaven,
this could be Ch. Potelle'
Then she pointed out the tour guide,
who said she'd show me the way
There were voices at the cellar door
I thought I heard them say…

Welcome to Oakville, California
Such a lovely place
May we ship you a case of Grace?
There's plenty of cab in Oakville, California
Any time of year, you can find wine here.

Their minds are Taransaud-twisted
They got the Mercier bends
They got a lot of bretty, bretty notes
in their premium blends
How they smell of the barnyard,
sweet scent of horse sweat
Some are wines to remember,
Some are wines to forget

The nose brought up notes of mercaptan,
'Please bring me neither cab nor merlot wine'
She said, 'We haven't had that sort of spirit here
since nineteen eighty nine'
And still those voices are calling from far away,
Break your concentration in the middle of a flight
Just to hear them say…

Welcome to Oakville, California
Such a lovely place
In a Golden State of Grace
They're livin' it up in Oakville, California
What a nice surprise to find here the wines of Marcel Deiss

The lifestyle is so appealing
The Domaine Chandon on ice,
And she said, "We're just looking for tourists here,
who'll pay full retail price"
At the winemaker's dinner
They gathered for the feast
They pair it with their steely chards,
But they just can't compete with roast beast

Last thing I remember,
My trunk was loaded up with very dear wine
I had to find the side road back
Onto Highway Twenty Nine
I was told, "relax, it's good shite, man"
You are programmed to believe
You can write a personal check any time you want
But your Amex card you can never leave

Monster Grenache

sung to: *The Monster Mash (Bobby "Boris" Pickett)*

I was working in the wine lab late one night
When I tasted a grape I thought might be a little bit light
But the wine was monstrous and from the glass did rise
And suddenly to my surprise
Billowed forth intense aromas from a wine of size
It was a monster Grenache
We had a monster Grenache
(it was Grenache)
It was a vineyard smash
(it was a Grenache)
It went great with goulash
(it was Grenache)
It was a monster Grenache

To my wine laboratory down in Santa Cruz
From Aureole restaurant where all the great
chefs schmooze
The *sommeliers* all came,
these good ole boys
To catch a little sip of my Clos de Gilroy

(they drank Grenache)
They drank monster Grenache
(they drank Grenache)
It was a culinary smash
(they drank Grenache)
It could be served with *panache*
(they drank Grenache)
They drank monster Grenache

The tasting party was wild,
as befitting a new release
The guests included Henri Bone-eau, Michel
Cryptoutier, Marcel Gui-ghoul and his *fils*
The wine was really killer, a fragrant,
full-bodied red
Some older vintages were exhumed and
pronounced very much undead
The Dead Leaf Bottlers
were about to arrive
With their vocal group The Rayas-kicker Five
(they drank Grenache)
They sipped the monster Grenache
(they sipped Grenache)
It was a vineyard smash
(they sipped Grenache)
It caught on in a flash
(they swirled Grenache)
They swirled their monster Grenache

From deep, deep cold storage Vlad
the Impeller's voice did ring
Seems he was troubled by just one thing
He opened the screwcap, shook his fist and
what did he say?
'Whatever happened to the Le Gaucher?'
(it's now Grenache)
It's now monster Grenache
(it's now Grenache)
And it's a vineyard smash
(it's now Grenache)
It caught on in a flash
(it's now Grenache)
It's now monster Grenache

Now everything's cool
Vlad's down with the brand
And the monster Grenache is the
hit of the Land
For you, who are grateful for red,
this Grenache was meant too
When you get to the wine shop tell them
The Rhône Ranger sent you
(it is Grenache)
It is monster Grenache
(it is Grenache)
It was a *Graves-yard* smash
(it is Grenache)
It has caught on in a flash
(*Vive le Grenache*)
Long live Monster Grenache

Soils and wine grapes of the Napa Valley AVA

BY Paul W. Skinner, Ph.D.
Soil Scientist, Terra Spãse, Inc.

Soils have long been associated with the distribution of quality vineyards and production of premium quality grapes and wines in both new and old world viticultural areas.[1,2,5] The gravelly soils of Bordeaux, the rocky alluvial fans of the Rhône and Alsace, the slate soils of the Mosel, the chalk soils of Champagne, and the terra rosa soil of Australia are all well-known examples of soils associated with premium viticultural areas and wine grape production.

Soil type has also played an important role in vineyard development within the Napa Valley American Viticultural Area (AVA). Increasingly, soil type is influencing the planting of premium wine grape varietals within Napa Valley, as growers consider its effect on vine rootstocks, spacing, trellis configuration, and overall vine vigor.

The soils of the Napa Valley AVA exhibit a wide range of unique characteristics that allow for production of many different premium grapes and wines. A recent *Soils and Wine Grapes in the Napa Valley AVA* report by my company, Terra Spãse, Inc., examines properties that characterize the soils of the Napa Valley AVA, and attempts to elaborate upon their connection to the existing potential for production of premium quality wine grapes there. A brief review of the report's major findings follows below.

Napa Valley AVA soils

Soils of the Napa Valley AVA are complex expressions of the climate, biology, topography, and geology that developed within the area over a long period of time. There are 33 soil series mapped within the boundaries of the Napa Valley AVA (National Resource Conservation Service Soil Survey, 1977).

A soil series is the basic unit of soil classification, consisting of soils that are alike in all major profile characteristics except the texture of the surface layer. Napa's 33 soil series represent six of the 12 soil orders that comprise modern soil taxonomy. This fact alone indicates an incredible diversity of soils within a relatively small area.

The soils of the Napa Valley AVA vary throughout the region. Texture, depth, drainage, organic matter, and rock fragments all exhibit considerable ranges across the Napa Valley AVA soil landscape. The mosaic of soil series reflects the complex factors of soil formation that are present there and set the area apart from many other grape-growing regions of the world.

Distribution of soils in the Napa Valley AVA

There are currently 14 individual AVAs within the Napa Valley AVA. The report provides detailed maps showing distribution of soil types and their characteristics within these AVAs. Individual maps of soil series distribution, elevation, shaded relief, depth to bedrock, drainage class, hydric soil status, estimated soil organic carbon, and a NDVI (normal-

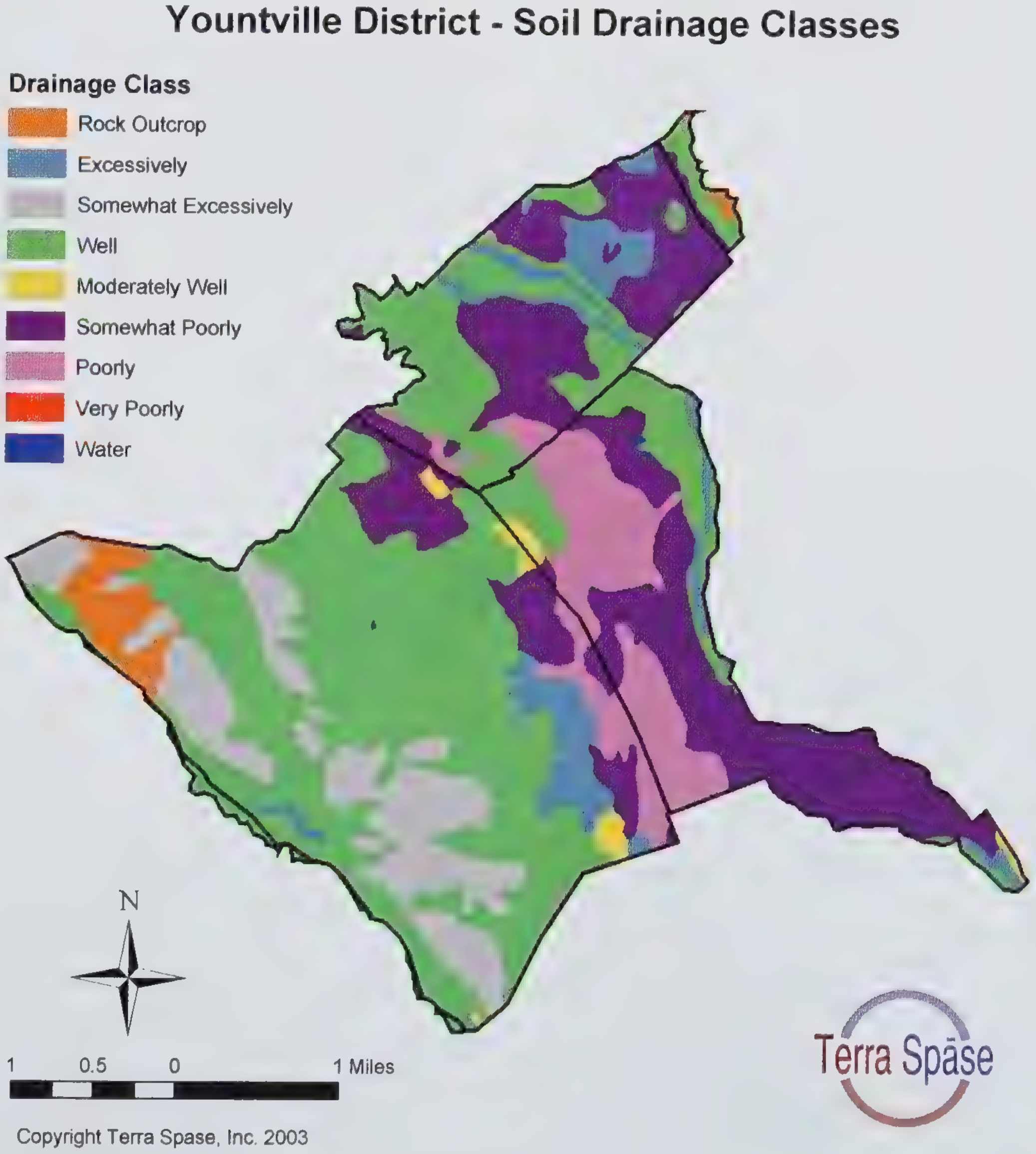

Figure 1

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ized difference vegetation index) are also included.

Three individual AVAs offer interesting snapshots of the region:

Los Carneros

The soils of the Los Carneros region form a patchwork across the landscape. Variations in soil characteristics result in abrupt transitions from premium Chardonnay to Merlot and Pinot Noir vineyards within relatively short distances. Pinot Noir is typically planted on low vigor-potential soils, including the Forward and Bressa series that have some type of restriction (depth, clay layer, high percentage of gravel or rock in the subsoil, etc.). Greater vigor-potential soils with fewer depth or nutrient restrictions, such as the Haire and Diablo soils, are often planted to Chardonnay and Merlot.

Yountville

Soils are predominantly well-drained in the western part of the AVA and need supplemental irrigation during the summer growing season (Figure I). A significant portion of the soils in the eastern Yountville AVA are somewhat poor to poorly drained, suggesting the need for subsurface drainage in the springtime, while a small percentage of soils in the central portion along drainages, streams, and rivers is considered hydric.

Mt. Veeder

Most soils within the Mt. Veeder AVA are derived from sandstone and shale or volcanic material. However, the variability of soil depth, texture, slope, and aspect across soil types is quite large. As a result, Mt. Veeder vineyards are often challenging to manage and low-yielding, but capable of producing premium quality fruit.

Many of the older vineyards were planted in the 1970s on steeply sloping soils using cut-and-fill terraces, St. George rootstock, and a standard bilateral cordon and California sprawl or T-trellis. This planting system, although practical and cost-effective at the time, resulted in some undesirable soil erosion and vine growth that was highly variable.

This system was replaced in the 1990s with vineyard plantings that parallel the slope without using terraces, in order to decrease the potential for erosion during the winter months. The newer vineyards also utilize phylloxera- and drought-resistant rootstocks, closer spacing, and vertical shoot positioning to achieve more balanced vine growth.

Soil effects on grapevine growth and production

Soils exert control over the growth and production of grapevines in the Napa Valley AVA via two major mechanisms. One is the influence of soil depth and texture (percentage of sand, silt, and clay) on the water-holding capacity of the soil.

The second major way in which soils directly control vine growth and production in the vineyards of the Napa Valley AVA is through their inherent and modified fertility levels. Soils are a reservoir of nutrients that are required by vines to complete their growth cycle.

Soils in Napa Valley range from loamy sand to clay textures, with a range in water-holding capacity from 0.36 inches to 2.62 inches per foot of soil, respectively. Top-soil depths range from 10 inches to more than 72 inches in many of Napa's major grapegrowing areas.

Water status of Napa Valley AVA soils

The total amount of water stored during the winter months of rainfall is a function of both soil texture and soil depth. Stored water is considered the primary reservoir available to grapevines during the growing season. Several Napa Valley AVA soils are capable of storing enough water during the winter months to supply grapevine water requirements for an entire growing season. These are the Bale, Pleasanton, Cole, and Yolo soils, which have supported dry-farmed or non-irrigated vineyards since the turn of the 20th century.

Vine nutrition and soil fertility

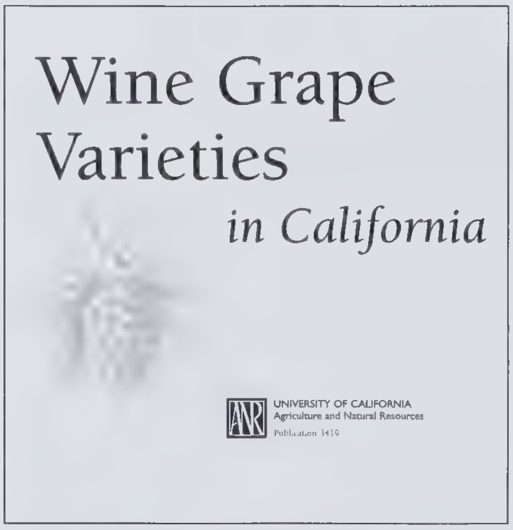
It is interesting to note that although most of the soils in the Napa Valley AVA differ in chemical and physical characteristics compared to many common soils in major vineyard regions of Germany, Italy, and France, vines growing in the upland areas of Napa Valley are subject to magnesium and phosphorus nutrient deficiency symptoms similar to those resulting from the same nutrient deficiencies in those European regions. These deficiencies can have direct and

Continued on page 86

EXCERPT from: *Wine Grape Varieties in California*

Vine Selection and Clones

**BY Deborah A. Golino,
Foundation Plant Services,
James A. Wolpert, Department of Viticulture & Enology,
University of California, Davis**



Wine Grape
Varieties
in California

UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources
Publication 3419

During the 1930s and 1940s, it became clear that virus diseases were reducing the productivity and quality of some vineyards in California. In addition, many commercially available grapevine selections were mislabeled or incorrectly identified.

By 1952, Harold Olmo of UC Davis led the formation of the California Grape Certification Association to develop, maintain, and distribute virus-tested and correctly identified grape stock.

By 1958, this program combined with the UC Davis disease-tested fruit and nut tree program to become the Foundation Plant Materials Service. Curtis J. Alley, a student of Dr. Olmo's who went on to become a faculty member in the UC Davis Viticulture & Enology Department, initially managed the collection. William Hewitt and Austin Goheen, UC Davis and USDA-ARS plant pathologists respectively, provided expertise in virus detection and elimination.

This program is now known as Foundation Plant Services (FPS). It is the home of the Foundation Vineyard, the source of grape varieties in the California Grapevine Registration and Certification (R & C) Program. The vines at FPS are "registered vines" with the California Department of Food and Agriculture. They must be maintained at certain standards of disease testing and inspection under state regulation. Wood from this Foundation Vineyard is sold to grapevine nurseries in the R & C program where it is also registered and maintained under a set of regulations.

These blocks of grapevines can be used by nurseries to create "certified stock" sold to growers. This certification assures growers that vines have successfully completed extensive virus testing. The majority of California's grape planting stock originates from this program. FPS is also authorized to import new grape selections from around the world, which adds to the diversity of planting stock available to grapegrowers. In addition to importing clones, FPS also works to preserve clones growing in California's premier vineyards.

There are two critical areas that need to be considered in developing a superior grape variety collection. First is disease status. Until a new selection is free of virus, vine performance is impossible to evaluate because vigor, yield, and fruit quality are all affected by grapevine viruses. By using certified grape nursery stock, growers can reduce uncertainty about vine performance.

Second, as selections of the same variety from different sources are compared, subtle performance differences between selections of the same wine grape variety become apparent. These differences are caused by mutations in genes that control characters such as leaf lobing, berry color, disease resistance, and ripening date. Over time, mutations accumulate and lead to greater diversity in older varieties. Selections that differ in these ways and have been evaluated are known as "clones" of a variety. Planting superior clones can improve a variety's production and winemaking characteristics.

Today, with increasingly diverse plant materials available, growers planting new vineyards need to consider choice of clone as well choice of variety. Most of the older FPS selections were collected by UC Davis scientists over the years both by selection from superior California vineyards and by plant exploration in other countries. New clones continue to originate from formal clonal selection programs and public research projects around the world.

Some of the programs that have contributed significantly to clonal diversity in California are ENTAV (Etablissement National Technique pour l'Amélioration de la Viticulture, in France); Geisenheim (Geisenheim Research Institute, in Germany); and Rauscedo (Vivai Cooperativi Rauscedo, in Italy). Where appropriate, the clone numbers of these programs as well as the selection numbers used by FPS are provided in the individual variety sections of *Wine Grape Varieties in California*.

New clones of the major winegrape varieties are added to the FPS Foundation Vineyard frequently. Researchers, viticulturists, and winemakers around the state work to ensure that valuable "heritage" field selections — those collected from premier vineyards with a reputation for quality wine — are available as certified selections. In some of California's oldest vineyards, these selections represent pre-1900 European introductions that may contribute greatly to varietal clonal diversity.

The same clone can be introduced more than once to FPS; each introduction receives a unique selection number to preserve its identity. In addition, sub-clones that have been produced by heat treatment or tissue-culture virus-elimination therapy also receive unique numbers. This has led to a sometimes bewildering accumulation of selection and clone numbers for plant materials that may not differ significantly in performance. This is even further complicated by the existence of European clones that have reached California through other importation centers and may be named according to a number of different conventions.

Vineyard / Estate / Winery
Specialists

Carneros Appellation, Sonoma
50 Acre Vineyard – Long term lease opportunity in the Carneros Appellation. Varietals include 11 acres of Chardonnay, 34 acres of Pinot Noir and 5 acres of Pinot Blanc. Planted from 1999 – 2001. *Asking $995,000*

Sierra Foothills Winery, Tasting Room & Restaurant 12.4 acres total with approximately 9 acres that appear plantable to vineyard. Two separate parcels. 1,500 sq/ft operating bonded winery, restaurant and tasting room. Additional 2,000 sq/ft residence. *Asking $1,499,000*

Carneros Vineyard Estate, Sonoma
27+ acres in the Carneros Appellation with several certificates of compliance, 17+ acres of premium vineyard including nearly 14 acres of Pinot Noir and 3.7 acres of Chardonnay. There is a remodeled 2,000 sq/ft farmhouse and the the potential for a lot split with the possibility of building another residence for a family compound. *Asking $2,195,000*

Cult Status Winery & Vineyard, Russian River Appellation 7.63 acres total with 3.25 acres of premium Cabernet Sauvignon and 3.25 staked and ready to plant. Fabulous award-winning winery, bonded winery facility and remodeled 2,000 sq/ft residence in a wonderful wine country setting yet close to all amenities. *Asking $2,750,000*

Russian River Appellation Winery, Vineyard and Residences 18.21 Acres total with 15 acres planted to premium Pinot Noir. 3-year-old 5,000 sq/ft winery with a 5,000 case permit. Gold medal winner at the Sonoma County Fair. Two remodeled residences, 1,700 sq/ft and 1,356 sq/ft. *Asking $4,850,000*

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Chalk Hill Appellation Vineyard & Winery Estate, Healdsburg 45 +/– acres with approximately 25 acres of premium vineyard, 10,000 case winery permit, 2,200 sq/ft Tuscan style custom remodeled residence, two wonderful lakes make this a magnificent setting. An opportunity for those interested in making the most of the wine country lifestyle. *Asking $4,950,000*

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An additional complication results from the intellectual property issues that have developed around winegrape clones. Some clones are trademarked and/or proprietary while others are in the public domain.

For example, FPS has public or "generic" selections of many of the ENTAV clones in the Foundation Vineyard collection that are known as "Reported to be French," with an ENTAV-assigned clone number and an FPS selection number. More than one FPS selection may be available from the same French clone, due to independent import and subcloning. These selections have no assurance of authenticity. However, clones that have come directly from ENTAV are part of a trademark program and are known as "ENTAV-INRA®." Not all of these trademarked ENTAV-INRA® clones are California certified; some have origins independent of the FPS program.

Today in California there is an unprecedented wealth of clonal material of the major grape varieties. Decisions on clones have become an integral part of the vineyard planning process. As in other wine regions, California growers want to know how clones might enhance viticultural performance and wine quality, or help create a particular wine style. With respect to this heightened interest in clones, several important points must be kept in mind:

Clone choice is only one of many important decisions when establishing a vineyard. Variety choice, site climate, soil type, vineyard design (spacing, trellising, and rootstock), and annual cultural practices (irrigation, canopy management, and crop load) will impact final wine quality far more profoundly than clonal choice. There is no such thing as a "perfect" clone that will overcome a grower's inappropriate site selection or poor management decisions.

There is no one "best" clone. A clone's suitability for a particular vineyard depends on the target wine market and desired wine style, as well as the site and vineyard conditions noted above. High-yielding clones are just as appropriate for low-cost wines as low-yielding clones are for high-value wines. When the retail bottle price for a variety can vary by more than 20-fold, there is clearly room for more than one clone. Thus, the term "best" is value-laden, and must be carefully defined by the producer's goals.

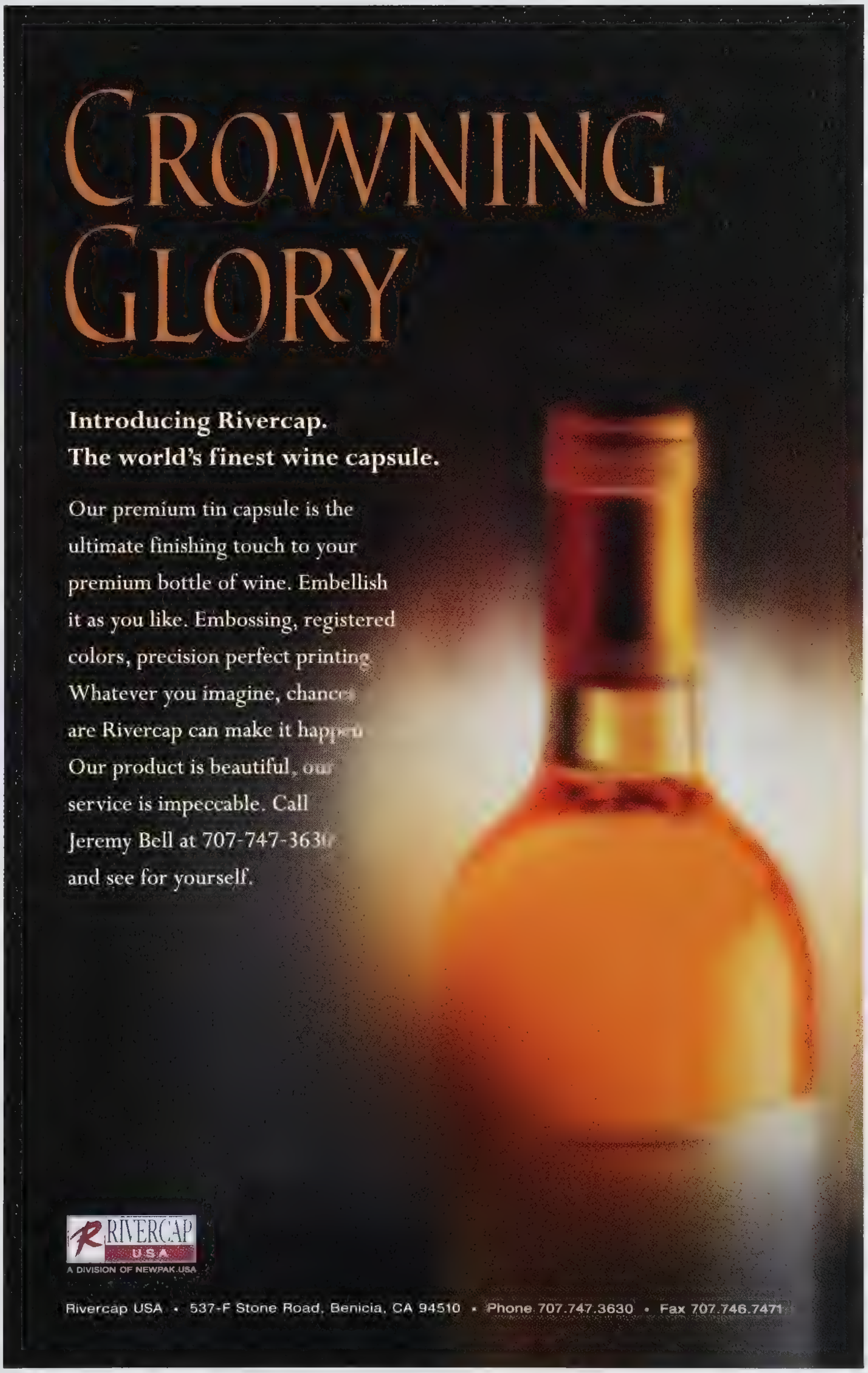
A clone selected in another country is not necessarily superior to what is available locally. Clones from regions known for fine wine, particularly Burgundy and Bordeaux, are highly sought after. However, the selection criteria must be explicitly understood to ascertain whether clones selected abroad have value in California. Climates abroad can differ dramatically from California's. Some wine regions have strict yield limits, often made possible by the high bottle prices their wines command. Thus, "good" clones in those regions are those that perform well under specific environmental and economic conditions, neither of which may apply to California. Before making a significant investment in clones selected in another country, growers should verify the performance of those clones under their local conditions.

Virus infections can compromise even the best clones. Clones selected for high-quality wine and freedom from virus are the most desirable. Severe viruses are not tolerated in any of the world's clonal selection programs. Growers should be aware that, in addition to registered selections of clones, there is a great deal of common stock sold in California that has never been checked for virus. European clonal selections that have entered the U.S. illegally and field selections from old, established vineyards are frequently infected by virus. Growers should avoid virus-infected planting stock, since many commonly used rootstocks are very sensitive to virus diseases.

Continued clonal evaluation of major varieties such as Cabernet Sauvignon, Chardonnay, and Zinfandel in California is supported by growers' and vintners' funding organizations. However, this progress is challenged by several complicating factors.

First, many varieties contribute significantly to the state's wine economy. In other countries, regions can concentrate on relatively few varieties of importance. Even for "niche" varieties with small acreage, such as Malbec, Viognier, Sangiovese, or Tempranillo, clonal performance is a significant issue because a new variety will not be accepted if the principal clone in use performs poorly.

Continued on page 81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BOOK REVIEW

OREGON VITICULTURE

New book emphasizes site-specific approach

BY Edward Hellman

From the wine industry's inception in Oregon, vintners there have focused on matching viticultural practices to each vineyard site. That is the recurring theme in *Oregon Viticulture*, a new book that is the successor to the popular *Oregon Winegrape Growers Guide* that was first published 12 years ago.

Oregon Viticulture is unique in its approach of combining the expertise and experience of university researchers with that of professional grapegrowers and winemakers. Many chapters were written by at least two authors with different perspectives; almost 50 individuals contributed to the 264-page book. Edited by Edward Hellman, the book is published by Oregon State University Press in association with the Oregon Winegrowers' Association.

Commercial winegrape growers, students, researchers, and serious home viticulturists will find *Oregon Viticulture* to be a valuable reference and easy-to-use guide. Lest you think the book is only about growing Pinot Noir in the cool Willamette Valley, readers will also learn of Oregon's warmer-climate regions, and the grape varieties and practices there. The book's extensive discussion of site-specific management in a wide variety of conditions makes much of *Oregon Viticulture* relevant to growers everywhere.

The stage is set for the site-specific theme in an early chapter devoted to the general principles of site assessment. The three levels of climate (macro, meso, and micro) are clearly defined, and their relevance is repeatedly emphasized. This chapter also discusses the important influences of soils, topography, and other factors from both the perspective of evaluating a potential vineyard site and the influence on management practices in existing vineyards.

"Matchmaking of climate and variety" is how the critical task of pairing grape variety to vineyard site is described in a chapter devoted to varieties and clones. The importance of this decision, particularly in a cool climate, is evident in this quote: "Within the vineyard habitat, soil is certainly a factor, but a far greater influence on grape quality is the interplay of the climate and the ripening period of the variety." Appropriate canopy management practices (covered in a later chapter) provide the favorable microclimate that is necessary to achieve a variety's potential.

A thorough introduction to grapevine physiology and function provides a prologue to the book's 31 chapters, building a foundation of viticulture fundamentals for new and experienced growers alike. Common viticultural terminology is introduced in this chapter, with more than 120 concepts defined in understandable language. Eight drawings and figures illustrate grapevine anatomy, morphology, and phenology.

The main body of the book includes three sections: vineyard planning, vineyard development, and vineyard management. The planning section includes chapters on vineyard and winery economics, site assessment, Oregon's winegrowing regions, varieties and clones, rootstocks, vineyard design, and training systems. A separate chapter is devoted to the Scott Henry vine-training system, which was developed in Oregon and is now used around the world. Illustrations accompany discussion of the common vine-training systems used in Oregon.

Aspects of vineyard development are addressed in chapters on site preparation, planting material, planting and managing a new vineyard, and training young vines. An extensive chapter on irrigation system design is included. It won't make an irrigation engineer out of you, but it will help you understand the requirements for your vineyard, so you can work effectively with an engineer.

The vineyard management section is the largest, containing chapters on pruning, irrigation, diseases, insects, floor management, canopy management, cold injury, frost protection, crop estimation and thinning, and harvest. The important topic of soil management and grapevine nutrition is given comprehensive coverage. Chapters devoted to organic and sustainable viticulture methods are also included. Other chapters cover the difficult issues of labor management, compliance with government regulations, and contracts. The section concludes with an extensive chapter on fruit ripening and maturity assessment.

Oregon Viticulture is 8½ x 11 inches, contains color and black and white illustrations, maps, graphs, tables, numerous references, and an index. It is available from the *PWV* Bookshelf for $44.95 (page 53). ■

Fetzer offers new organic grapegrowing handbook

BY L. Ann Thrupp, Ph.D.
Manager, Organic Development,
Fetzer Vineyards

Growing Organic Winegrapes
An Introductory Handbook for Growers

A handbook on organic grapegrowing, offering a wealth of information for growers interested in moving closer to organic production, is now available from Fetzer Vineyards.

The 64-page guide contains practical advice gleaned from Fetzer's experience farming 2,000 acres of certified organic grapes, and from many other scientific resources, organizations and vineyards in California.

The handbook is available from Fetzer's grower relations office, which hopes to increase the availability of certified organic winegrapes so the winery can use only organic grapes by the end of the decade. Other wineries are also demonstrating an increasing interest in organic grapes, so the handbook offers a survey of the current state of organic grapegrowing, and a useful starting point for those interested in learning more.

Growing Organic Winegrapes includes details on the meaning of organic agriculture and basic organic principles; reasons to use organic practices; how to farm organically; and how to become certified. It provides detailed information and resources on certified organic practices, products, and equipment and on how to farm sustainably as well as organically.

Chapters move from basic concepts and principles of organic farming, through steps necessary to become a certified organic grower, and practical how-to chapters on soil and fertility management, biodiversity, weed and pest management, and other sustainable farming practices. Information sources, websites, suppliers, consultants, and vendors for organic products are also listed.

Organic viticulture is an evolving science. It involves ongoing learning, monitoring, and adapting to conditions in the vineyard and environment of each location. Insights from winegrape growers who already have achieved success using organic methods are an important resource for the industry, and *Growing Organic Winegrapes* includes many of those.

Organic farming means using an integrated, "systems" approach to understanding the health of the vineyard. The organic approach starts with using cultural, mechanical, and other techniques to maintain vineyard health and prevent pests and diseases. Material inputs are applied as needed — but only as a last measure.

Many growers and scientists say winegrapes are among the easiest to grow organically.[1] Both large-scale and small-scale organic winegrape vineyards in California provide testimony in the handbook to the relative ease of organic grape culture in California.

Growing Organic Winegrapes is based on principles which have been widely adopted in various organic programs, and each principle is examined closely, with resource material cited. Below are the basic principles covered in the handbook:

Principles for Sustainable Organic Farming[2]

☐ **Building healthy soil**: Organic farming focuses on building healthy soil with high microbial activity, which is rich with beneficial microorganisms, organic matter, and humus.

☐ **Stewardship and conservation of resources:** Stewardship of natural resources, including the land, soil, water, and energy, is a strong motive of sustainable organic farmers; being stewards of the land is vital for ensuring productivity and for the welfare of future generations.

☐ **Avoiding synthetic chemicals:** Growing crops without using synthetic pesticides or fertilizers reduces the materials that have potential to cause harm to our environment, and it helps to create a safe and healthy environment for farmers, workers, and society in general.

☐ **Conserving biodiversity — working with nature**: Biodiversity in and around the vineyard is a valuable element that is conserved and/or enhanced by organic farmers. It helps maintain or create a balanced ecosystem. Organic farmers attempt to work with nature. For example, farmers try enhancing nature's functions by planting diverse plants in vineyards to attract beneficial insects.

☐ **Adaptation:** There is no uniform "prescription" or "recipe" for organic viticulture practices to fit all vineyards. The methods are not standardized. Instead, they vary from place to place, adjusted

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to local conditions. Growers usually modify their organic practices over time, as they learn new innovations and as environmental and farming conditions change.

❑ **Quality:** For the organic winegrape grower, maximizing the quality and taste of the grapes is a central aim that guides the production process.

Although growing organic winegrapes sometimes includes substituting synthetic chemical inputs with approved organic inputs, farming practices must reach beyond mere substitution to embrace practices increasing biodiversity in the vineyard, among other management practices.

The first edition of the handbook is available for $20, plus tax and shipping (total $25). Fetzer plans to publish future editions in 2005 and beyond, to provide updated information. Fetzer welcomes feedback from readers, which will be helpful in preparing future editions. For order forms contact Ann Thrupp or Gloria Seeley at (707) 744-7600 or download the order form found in the press room at www.Fetzer.com.

References

1. Ames, Guy, 1999, *Organic Grape Production*, ATTRA (Appropriate Technology Transfer for Rural Areas) Horticulture Production Guide, website www.ncat.org.

2. These principles are identified and derived in analyses of organic production and agroecology, including publications by ATTRA, SARE, Altieri, M (Agroecology), and L.A. Thrupp 2002, Fruits of Progress: World Resources Institute, Washington, DC.

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Korvan harvesters have been the best-selling grape harvesters in the U.S. for raisins, juice grapes, and wine grapes for the past four years. It has been Korvan's commitment to quality that has driven sales of these American-made harvesters.

In 2004, Korvan introduces some exciting new features: A John Deere turbo-charged engine is now standard on every new self-propelled Korvan grape harvester. Korvan has improved one of the best cleaning systems on the market by allowing the cleaning fans to reach higher speeds for unprecedented M.O.G. removal. Korvan has also introduced a new foldaway fan system for easier access to kicker belts.

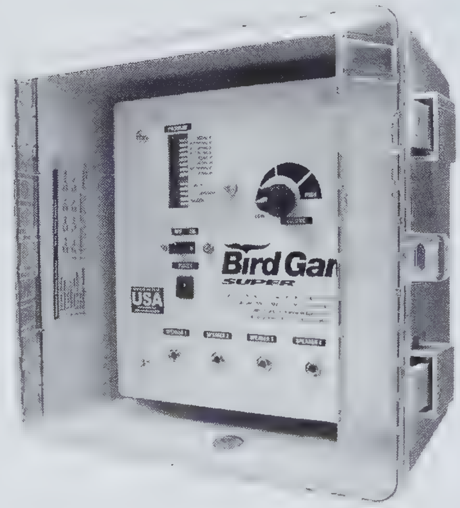
Korvan's bucket conveyance system and soft-touch bow rod harvesting system gently carry grapes to the gondola, delivering more clean, whole fruit. Because Korvan doesn't drag your grapes, Korvan picks the fruit that winemakers love.

Whether you're looking for a standard, wide-trellis, narrow bucket or tow-behind harvester, or even the gentle Orbirotor picking system, Korvan has the answer to meet your needs.

For more information:
Korvan Industries
270 Birch Bay Lynden Rd.
Lynden, WA 98264
tel: 360/354-1500; fax: 360/354-1300
CA representative: tel: 559/285-5804
website: www.korvan.com

PLEASE SEE KORVAN INDUSTRIES AD, PAGE 14.

BIRD GARD, LLC



"Bird Gard" and "Crop Gard" electronic bird repelling products drive unwanted birds away from orchards, vineyards, crops, and anywhere birds are a problem. Audible bird distress and harassment sounds are digitally recorded onto microchips and are effective against starlings, robins, grackles, seagulls, woodpeckers, and other pest birds. These sounds are then amplified and broadcast to protect areas from one acre (0.4 hectares) up to 40 acres (16 hectares). The new Bird Gard Super Pro introduces fully digital, random operation throughout, including sounds, speaker operation, and sound frequency variations, minimizing bird habituation. Protects up to six acres.

Bird Gard® LLC

Bird Gard offers a one-year customer satisfaction guarantee, and is manufactured in the U.S.

For more information:
Bird Gard, LLC
Terry R. Denzer
601 North Larch St.,
PO Box 1690, Sisters, OR 97759
tel: toll free: 888/332-2328 or 541/549-0205
fax: 541/549-5286

CENTRAL VALLEY BUILDERS SUPPLY

"CV has been a partner with the vineyard industry since the beginning," says Kathie Patterson, president of Central Valley (CV) Builders Supply. "We have grown into one of Northern California's premiere suppliers of vineyard products and equipment."

CENTRAL VALLEY
BUILDERS SUPPLY
AGRICULTURAL DIVISION

The CV Ag Department carries a huge assortment of vineyard supplies and farming products, including trellis, fencing, irrigation, drainage, and other supplies. Visit the website at www.cvbsupply.com for a complete list of supplies and links.

In 2003 CV completed a major renovation of the St Helena facility, adding a 30,000 sq. ft. full service nursery. Also included in the renovation is the expansion of the Rental Department, adding to the inventory of construction equipment.

CV is actively adding to existing inventory, increasing focus on providing additional products and services for irrigation and landscape contractors in both its St Helena and Napa facilities.

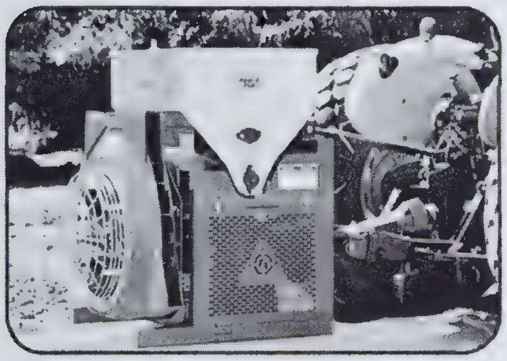
In addition, CV has a 13-acre, state-of-the-art distribution center located in American Canyon. This facility is one of the largest lumber, irrigation, and agriculture distribution centers in California.

For more information, contact:
Central Valley Builders Supply
1100 Vintage Ave., St Helena, CA 94574
tel: 707/967-4300; fax: 707/ 963-8952
or: 1790 Soscol Ave., Napa CA 94559
tel: 707/257-8888; fax 707/261-2962

PLEASE SEE CENTRAL VALLEY BUILDERS AD, PAGE 36.

FLORY INDUSTRIES

Flory Industries, a leading agricultural equipment manufacturer since 1936, has engineered the Flory *Pow'r Flo* Dusters for sulfur dust application, and the Flory 1000 Series Flail Mowers for maximum efficiency in vineyard management.



The Flory Model D-20 3-point Duster and TD-20 Tow Duster feature continuous positive-flow and a quiet double-sided centrifugal fan for uniform coverage. Flory's field-proven fan design produces an even discharge, virtually eliminating "hot spots" during sulfur application. These units are compact in size for narrow rows, yet powerful enough to handle wide rows. The stainless steel hopper and metering components, plus heavy-duty gearbox, ensure years of trouble-free operation.

Flory 1000 Series Flail Mowers are built for durability with a ⅜" endplate thickness, ¼" case thickness, and rigid tubular frame. Each mower is equipped with forward rotation and heavy-duty industrial knives. They are available in cutting widths ranging from 54" to 90" and options include scoop knives and reverse rotation.

For more information, contact:
Flory Industries
PO Box 908, Salida, CA 95368
tel: 209/545-1167; fax: 209/543-7646
website: www.floryindustries.com

PLEASE SEE FLORY INDUSTRIES AD, PAGE 47.

RANDELL EQUIPMENT CO., INC.

For 56 years, Randell Equipment has built quality sprayers for numerous applications. From grapes to weeds, Randell Equipment has the right sprayer for you. Whether you want a self-propelled herbicide sprayer for weeds on the vineyard floor, a pesticide/ fungicide multi-row over-the-vine sprayer for spraying vines, or even a custom-designed sprayer, Randell Equipment can provide the sprayer you need.

Randell Equipment takes pride in offering both new, cutting-edge technology and older, standard methods of spraying.

The electrostatic over-the-vine sprayer (pictured on front cover and above) will deliver twice the deposition with half the chemical and significantly reduces runoff and drift, saving time and money.

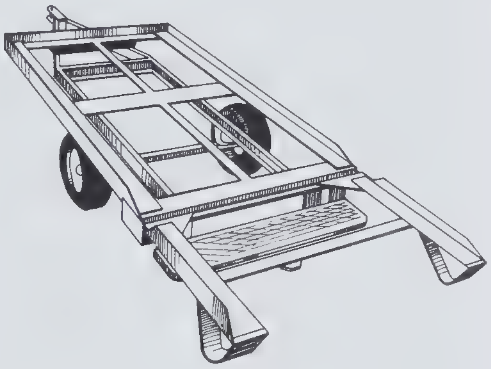
Randell models of self-propelled herbicide sprayers make spraying weeds more efficient.

Next time you're looking for a sprayer, contact Randell Equipment Co., Inc.

For more information, contact:
Randell Equipment Co., Inc.
Nathan Chance
PO Box 777, Woodlake, CA 93286
tel: 559/564-3396; fax: 559/564-3051
e-mail: nathanc@randellsprayers.com
website: www.randellsprayers.com

WESTERN SQUARE INDUSTRIES

Western Square Industries manufactures vineyard bins, trailers, and wine barrel racks.



Western Square's two-ton vineyard bins are manufactured in stainless or mild 14-gauge steel. The sides, endwalls, and bottoms are lap-welded to ensure strength and watertight integrity. The D-ring end is ribbed to transfer the stress of hoisting to the entire height of the bin end. Mild steel bins are powder-coated in a variety of colors with an FDA-approved, food-grade epoxy inside. These and other features ensure years of trouble free use.

Western Square vineyard trailers are offered in six styles designed for narrow or wide vineyard rows. Trailer configurations accommodate two-ton harvest bins or up to three 4-by-4 plastic bins. Several styles are outfitted with ramps and plastic slides to drop bins without needing a forklift, facilitating a speedy return to the harvest. A new tilt trailer design eliminates the need for a hydraulic lifting mechanism. Simplicity of design and a durable powder coat finish contribute to easy maintenance. Add a 4-by-8 sheet of plywood and the trailer becomes a utility trailer for off-season projects.

All Western Square products are manufactured in America.

For more information, contact:
Western Square Industries
Trygve Mikkelsen
1621 N. Broadway, Stockton, CA 95205
tel: 209/944-0921 or
inside CA: 800/367-8383;
outside CA: 800/367-7810
website: www.westernsquare.com

PLEASE SEE WESTERN SQUARE'S AD, PAGE 33.

EURO-MACHINES

Euro-Machines has expanded the current sprayer line, consisting of the proven Holder Cross Current Sprayers and JOCO Recycling Sprayers, with Berthoud's SUPAIR.

The Berthoud SUPAIR can spray up to four vine rows, with three spray heads on each boom. The spray heads have independent shut-off and flow-dial adjustments. This allows the operator to match the spray heads to the canopy being worked in, and obtain 100% even coverage. The vertical boom design adds to the environmental benefits of the sprayer: no drift and controlled spray concentration for the targeted canopy. The sprayer has a low noise level. Since the sprayer covers four rows, potential soil compaction is also reduced. Euro-Machines offers the viticulturist the right sprayer for the multi-purpose BRAUD Harvester, 2-row with automatic slope adjustment to the 4-row design. High output, high-pressure, air assist, direct air, or recycling.

For further information, contact:
Euro-Machines, Inc.
EAST: 540-825-5700
WEST: 4950 E. Fulton Dr.
Suisun City, CA 94585
tel: 707/864-5800; fax: 707/864-5879

PLEASE SEE EURO-MACHINES AD, PAGE 26.

WEED BADGER DIVISION

Weed Badger supplies tools to completely mechanize precision undercanopy management. Now growers can easily manage the challenges of hill-up, hill-down, and border shaping in addition to herbicide-free in-the-vine-row weed control.

Weed Badger's unique horizontal rotary tillage head is bi-directional. The Weed Badger® frame can be tilted side to side, and depending on direction of rotation, can hill-up soil toward the vine-row, or pull-down soil.

The company supplies both forward-wound and reverse-wound tines to produce the exact results growers desire. These adjustments allow vineyard managers to reshape berms and manage the vineyard floor after disking has caused soil accumulation. The on-the-go adjustable Weed Badger® also works easily in terraced rows. Maintain clean, clear-flowing irrigation furrows without hand labor.

The Badger Broom attachment is ideal for removing trash and debris from the vine row. Cleaning and sanitizing under the canopy reduces pest, fungus, and rodent-related problems. It's also a labor saver for spring cleanup, after hill down. The Badger Broom will gently sweep away the soil from the vine base, eliminating all manual cleanup.

For more information, contact:
Weed Badger Division
5673 95th Ave SE, Marion, ND 58466
tel: toll free 800/437-3392
website: www.weedbadger.com

PLEASE SEE WEED BADGER'S AD, PAGE 9.

FERRARI TRACTOR CIE

New Rotoking vineyard tiller. The aggressive digging, the weight, and rigidity of the "Rotoking" allows it to work the hardest, driest soils, including those containing gravels and other decomposed stones. The Rotoking 1300 works a 54-inch wide swath and weighs over 800 pounds. A large diameter rotor equipped with "cape chisel"-like tines that enter the soil vertically, penetrates while conventional tillers just bounce and chatter along the surface. Each chisel is replaceable and breaks up soil, leaving it spread evenly.

The spikes of the Rotoking leave the subsoil jagged, not smeared as rototillers do; thus no work-pan is formed. The Rotoking has a 4-speed gearbox, allowing you to choose a lower rotor speed to give the desired degree of tilth without overworking the soil surface and creating too much dust. Most conventional tillers turn more than 225 rpm.

The Rotoking lets you maintain an optimal soil structure while eliminating weeds and leaving an attractive vineyard appearance. All these benefits from Rotoking 1300 for just $4,300. A Rotoking 1600 (64-inch working width) is $5,300.

For more information, contact:
Ferrari Tractor CIE
PO Box 1045, Gridley, CA 95948
tel: 530/846-6401; fax: 530/846-0390
website: www.ferrari-tractors.com

WADE RAIN MICRO IRRIGATION

The Pulsator, one of the Wade Rain family of irrigation products, provides frost protection and cooling at drip-flow rates for vineyards. Its low flow rate makes it an ideal choice for frost protection in vineyards with drip irrigation. For new installations, the Pulsator's unique features make it a logical choice for both cooling and frost protection.

Most drip systems provide sufficient water-per-acre to supply a Pulsator Frost Protection and/or Cooling System, using no more water than is normally supplied to a typical irrigated vineyard (1 GPH/vine). Because the water is concentrated in a narrow band over the cane row, application rates equivalent to a conventional overhead sprinkler system are obtained while enjoying tremendous water savings. The cost of large reservoirs, pumping plants, additional mainlines, and impact sprinklers are eliminated.

The Pulsator:

- Provides frost protection tested to below 26°F.
- For cooling, it generates a 15° reduction in plant temperature in 10 minutes.
- Offers direct conversion of existing drip systems.
- Applies water continuously to vines — unlike 30 to 45 second intervals for impact sprinklers.
- Reduces soil saturation and runoff.

For more information, contact:
Wade Rain Micro Irrigation
Tony Pereira
2851 E Florence Ave., Fresno, CA 93721
tel: 559/485-7171; fax: 559/485-7623
e-mail: tpereira@waderain.com
website: www.waderain.com

OXBO INTERNATIONAL CORP.

OXBO International Corporation's vMECH system now makes it possible and practical to fully mechanize the most labor-intensive cultural practices in vineyards today. OXBO has successfully developed and refined specialized row-units for shoot thinning and fruit thinning grapes grown on Vertical Shoot Positioned (VSP), Lyre, and quadrilateral training systems.

For 2004, precision machine pruning has been added. The system and its technology are available exclusively from OXBO. Its technology is formed by 12 patented designs known as the Morris-Oldridge system.

Row-units are designed with quick-attach for convenient setup on the dual-boom OXBO vMECH 2220 trailer unit. Minimum row spacing is six feet. The vMECH trailer's unique axle widening system adjusts on-the-fly for wider rows and stability on slopes up to 25%.

GreenTech sprayers are also part of OXBO's vineyard equipment, including single and two-row vineyard sprayers in trailer and 3-point hitch configuration. A three-row model mounts on OXBO's over-the-row tractor (the Freedom Series 2200FS) or to a self-propelled harvester chassis. The sprayers feature combination fan/spray heads that deliver a high volume of air for more effective application.

For more information:
OXBO International Corp.
California: 10608 E. Mountain View
Selma, CA 93662
Scott King: 559/891-8727
Washington: 310 Tippett Lane
Pasco, WA 99301
tel: 509/544-0362
email: sking@oxbocorp.com
website: www.oxbocorp.com

PLEASE SEE OXBO INTERNATIONAL AD, PAGE 68.

ROHRER MANUFACTURING

Rohrer Manufacturing announces a new line of customized interchangeable sleeves that enable Man-Saver air-powered T-post drivers to drive almost any shape posts available.

The "Man-Saver" takes the back-breaking labor out of vineyard trellis building and saves hours of exhausting work. This revolutionary new tool is essential to making trellis building a safe and easy one-person job.

The Man-Saver patented, air-powered T-post drivers feature durable steel construction and an operating speed of 80 to 85 strokes per minute. They run off any small air compressor that delivers at least 2.2 cubic feet of air at 70 to 110 PSI. The compact size makes remote locations and tight spots accessible. The drivers range in weight from only 26 lbs for the basic T-post driver up to 48 lbs for the largest model.

The Man-Saver is available direct from the Rohrer factory. Prices start at $450 for the basic T-Post Driver. Additional sleeves are available for different fencing needs.

For more information:
Rohrer Manufacturing
Dan Rohrer
tel: 800/438-7599, access 03
website: www.rohrermfg.com

PLEASE SEE ROHRER MANUFACTURING AD, PAGE 18.

Terra Spāse, Inc.

Terra Spāse, Inc., a leading provider of information and technology to the winegrape industry, offers services and equipment to assist vineyard professionals in establishing irrigation management and soil fertility programs to enhance production of premium quality fruit.

The company's technology includes equipment to measure on-site weather, soil moisture, vine water status, and vine canopy density. Terra Spāse's information includes near real-time North Coast weather data and vineyard-specific maps of vine water status, soil moisture holding capacity, and NDVI maps of vine canopy density.

Terra Spāse offers the latest technologies for monitoring weather and soil moisture status on a near real-time basis in vineyards, including C-probes and watermark sensors. Vine-based water status can be measured using the latest pressure chamber and infrared equipment. Soil moisture holding capacity maps are produced using Terra Spāse's Terroir™ Analysis program.

Weather data for Napa and Sonoma counties (frost forecasts, weather and disease risk maps, individual weather station data, and weather and disease forecasts) as well as Fox Weather, LLC products, are available online at www.terraspase.com.

Terra Spāse has just released *Soils and Wine Grapes in the Napa Valley AVA* and *Weather and Wine Grapes in the Napa Valley AVA*, two comprehensive reports on the soil and weather conditions that influence wine grape production and quality in the Napa Valley AVA. (See page 00.) These reports can be ordered from the above web site or by contacting Terra Spāse.

For more information, contact:
Terra Spāse, Inc.
345 La Fata St., Suite D
St. Helena, CA 94574
tel: 707/967-8325; fax: 707/967-8596
e-mail: terraspase@earthlink.net
website: www.terraspase.com

PLEASE SEE TERRA SPASE'S AD, PAGE 34.

JWB Marketing/Bird Gard

Bird Gard/JWB Marketing sells the Bird Gard PRO series of digital, distress-call bird repellers. There's a model for three acres, one for up to six acres, and the MEGA PRO with a 200-watt amplifier and 20-speaker tower that covers up to 40 acres.

The Crop Gard PRO series uses harassment sounds for tough birds like linnets, mocking birds, and high-pressure from starlings and robins. Like the Bird Gard, there's a model for three acres, one for up to six acres, and the MEGA PRO with a 200-watt amplifier and 20-speaker tower that covers up to 40 acres. When combined, the two systems achieve results comparable to netting.

Bird Gard/JWB Marketing's exclusive visual scare product is the Scare Windmill. It uses a unique uv-light-reflecting paint on the blades to repel birds in a two-acre area. Recently, it was discovered that one-half of a bird's vision is within the uv-light range. The movement of the blades in the wind looks, to the birds, like the commotion of a flock of birds taking off in fright, which causes a chain reaction.

For more information, contact:
JWB Marketing/Bird Gard
2308 Raven Trail, West Columbia, SC 29169
tel: 800/555-9634; fax: 201/666-7581
e-mail: birdgard@ix.netcom.com
website: www.birddamage.com

Ag Industrial Manufacturing, Inc.

Ag Industrial Manufacturing, Inc. (AIM) offers the GH-9000 self-propelled grape harvester with an FMC picking head. With over 30 years of custom harvesting experience and 23 years of retrofitting the FMC head into other harvesters, AIM has designed its own machine, with 15 years of field operation.

All-hydraulic leveling includes 38 inches side-to-side (equivalent to 30% plus side slope). The harvester will work on 25% up/down slope (in direction of travel) and the front/rear pitch can be adjusted independently. The sharp steering angle permits easy turns at the end of vine rows.

The FMC head provides excellent picking quality, with very low MOG and some selectivity between raisins, rot, second crop, and good quality berries. It is lightweight (approximately 1,000 lbs.), self-centers on the vine row due to a balanced, free-floating design, and inexpensive to maintain. On average, it harvests 600 to 700 acres in one season without major maintenance.

AIM also offers: vine lifting and tying machines, trimmers, prepruners, and brush rakes, all tractor-mounted. Grape gondolas and the "Sonoma Leafer," a patented leaf-removal system using super-heated steam, are other products.

For more information, contact:
Ag Industrial Manufacturing, Inc.
PO Box 53, Lodi, CA 95240
110 S. Beckman Rd.
tel: 800/700-2461, 209/369-1994
fax: 209/333-0736

KIMCO MFG., INC.

If you are looking for a way to reduce the cost of controlling weeds in the vine row, Kimco has the answer. The Kimco Model 9300 is a heavy-duty in-row tiller that operates under virtually any vineyard condition. It can remove weeds from those just sprouted, to those that have grown clear into the canopy.

The Kimco works in soil conditions other machines cannot handle. In soils from sand to clay to rocks in virtually any combination, it removes the weeds, often more effectively and at a lower cost per acre than chemicals.

The Kimco is always mounted ahead of the operator for better visibility and operator convenience. The operator is always in control, and can easily override the automatic vine sensor, and adjust the tilling depth on the go.

The Kimco Model 9300 in-row tiller and its companion, the Kimco M-9700 in-row mower, have proven to be very cost-effective controllers of weeds in the vine row.

For more information:
Kimco Mfg., Inc.
9200 W. Barstow Ave., Fresno, CA 93722
tel: 559/277-9300 or 800/356-9641
fax: 559/277-9358
e-mail: sales@kimcomfg.com
website: www.kimcomfg.com

PLEASE SEE KIMCO MFG AD, PAGE 38.

Reduced Pest Management

Continued from page 19

19.6-acre demonstration vineyard within the ranch is planted to Chardonnay, on a VSP trellis, and has riparian vegetation on two perimeters.

Pierce's disease, transmitted by bluegreen sharpshooters, is present on the north side of the demonstration vineyard. In 2003, Surround®, a kaolin clay product reported to repel insect pests and reduce sunburn in grapes, was applied at the rate of 25 lbs per acre, beginning on May 19. Additional applications were made to a three-acre block within the vineyard on June 12, June 26, and August 7. Weekly monitoring demonstrated that Surround was effective in reducing grape leafhopper, mite, and bluegreen sharpshooter populations in 2003.

Horn thinks that more information is needed to determine what happens to those insect populations. Do they move to other vineyard blocks, driving those populations up? Do they move to the riparian area? Or do they simply not hatch? Other Sonoma County grapegrowers have reported that Surround is also an effective deer repellent.

Conclusions

Trends in pesticide use and pest management practices in California winegrapes and the factors contributing to these changes are complex and changing. Use of pesticides under FQPA review has declined. Winegrape growers have demonstrated innovation in reducing pesticide use by their willingness to experiment with biological and cultural controls and by implementing principles of IPM.

Grower innovation and experimentation with reduced-risk farming practices may be promoted through increased collaborative research and education programs. Winegrape growers and their representative commodity organizations represent a successful model for increasing grower adoption of reduced-risk farming practices.

Acknowledgement

1. Research was funded by the U.S. EPA FQPA transition program under a grant titled, "On-farm innovation: identifying farming success of low use of pesticides through mining the PUR database." Research was carried out at the Agricultural Geographic Information Systems (AGIS) laboratory at UC Davis under the direction of Dr. Minghua Zhang. The project partnered with Joe Browde and the Pest Management Alliance to assess use trends for FQPA-targeted pesticides in California winegrapes.
2. The SCGGA IPM program has received funding from the California Department of Pesticide Regulation, US EPA Region 9, and USDA Western Region SARE.
3. Acknowledgement and thanks to contributors and those who reviewed and provided suggestions for this text.

References

1. Bugg, Robert, and Mark Van Horn (1998). "Ecological soil management and soil fauna: Best practices in California vineyards." In R. Hamilton *et al.* (ed.), Proceedings of the Viticulture Seminar: Viticultural Best Practices. Mildura, Victoria, Australia: Mildura Arts Center.
2. California Department of Pesticide Regulation (DPR). Pesticide Use Reports 1993–2002. Sacramento, CA.
3. Chambers, Robert, Arnold Pacey, and Lori Ann Thrupp, editors, (1989). "Farmer First: Farmer innovation and agricultural research." London: Intermediate Technologies Publications.
4. Federighi, Veda, ed. (2001). "Regulating pesticides: The California Story." Sacramento: CDPR.
5. Selener, Daniel *et al.* (1997). "Farmer to farmer extension: Lessons from the field." Quito: International Institute for Rural Reconstruction.
6. U.S. EPA. 2003. "Reducing pesticide risk." Retrieved on November 12, 2003 from http://www.epa.gov/pesticides/health/reducing.htm).
7. Flint, M.L. and P. Gouveia (2001). "IPM in practice: Principles and Methods of Integrated Pest Management." University of California Statewide Integrated Pest Management Project. Agriculture and Natural Resources Publication 3418.
8. Gubler, W.D., M.R. Rademacher, S.J. Vasques, and C.S. Thomas (1999). "Control of powdery mildew using the UC Davis powdery mildew risk index." In: *Plant Pathology On-line*, www.apsnet.org, January 6–31.

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ASEV-EASTERN SECTION SYMPOSIUM

Focus on grapes, wine and environment

BY Bruce Zoecklein
Enology-Grape Chemistry Group
Dept of Food Science & Technology
Virginia Tech

The American Society for Enology & Viticulture, eastern section, will conduct its annual technical meeting, along with a "Grapes, Wine and the Environment" symposium, July 14–16, 2004.

The symposium will focus on how soils, climate (particularly temperature), and cultural practices affect fruit and wine composition and quality. The program will be held at the Hotel Roanoke and Conference Center, Roanoke, Virginia. Additional information is available at www.nysaes.cornell.edu/fst/asev/ or www.vtwines.info.

The symposium will feature discussion on the relationships between *terroir*, including climate, and aroma/flavor production.

A keynote opening presentation will be provided by Cornelius (Kees) van Leeuwen, viticulturist at Chevel Blanc, in Bordeaux. Kees has a rare academic distinction of holding doctoral degrees in both enology and agronomy. He is a professor of viticulture at ENITA (Bordeaux Agricultural University) with research in the *terroir* effect in viticulture.

Van Leeuwen's work with Dr. Seguin, at the University of Bordeaux, is some of the most detailed studies of how soil physical structure affects water relations of the vine, in particular the duration of vegetative growth, berry size, and the ultimate wine quality.

Van Leeuwen will provide an overview of viticultural practices that promote quality wine production in Bordeaux, followed by a second discussion that deals more specifically with soil effects on vine-water relations.

There is a widely held belief that optimal aroma/flavor production in the fruit destined for wine is derived from moderate daytime temperatures and cool-to-cold nighttime temperatures. The van Leeuwen presentation will evaluate the impact of day/night temperatures on grape and wine quality.

In some grapegrowing regions, the grape cultivars are selected such that maturity occurs just before the mean monthly temperature drops to 10°C. In warm regions, the length of the season is more than adequate to ripen the fruit and, indeed, fruit maturity in the final stages occurs in the warm part of the growing season.

Traditionally, climatologists categorize two general types of vineyard sites. Climates termed "Alpha zones" exhibit moderate daylight temperatures and cool night temperatures for the last three weeks of fruit maturation. Alpha zones have a mean temperature between 9° and 15°C during this time.

"Beta zone" climates have a mean temperature of 16°C or higher. Beta climate days and nights are warmer, which may offer expeditious ripening that can be advantageous for grapes, depending on the variety and phenology.

Temperature requirements during the latter stages of ripening dictate which climate zone may be best suited for specific varieties. Floral and high-acid varieties, such as Sauvignon Blanc, may do better in Alpha zones, which would help the grapes retain their high acidity and varietal character.

Chardonnay, on the other hand, can be grown for premium wine quality in both Alpha and Beta zones, each zone producing its own unique characteristics in the wine.

Matching the variety to the most suitable macroclimate depends on the ripening time required for the variety, and the intended style. Optimal climate/variety matching is a goal to help maximize the potential wine quality.

Erland Happ, winemaker at Happs and Three Hills Winery, Western Australia, will discuss the concept of heat index to categorize site climates. Happ seeks to match a winegrape variety to its optimal thermal climate, particularly the heat load experienced in the post-veraison period.

Happ's basic premise is that grape composition is fundamentally the same at veraison the world over, and what chiefly distinguishes quality fruit from mediocre fruit is determined in the month or so prior to harvest.

In several of his publications on this subject, he has suggested it is not useful to rely on maximum or minimum temperatures to describe a day's thermal characteristics. If the movement of temperature between the daily max and min exhibited the properties of a straight line, the mean would provide the average temperature experienced. The true average temperature, however, often lies far away from the mean. Additionally, he suggests that there is only a poor correlation between mean temperature and aroma/flavor.

Happ has authored a series of articles in the *Australian and New Zealand Wine Industry Journal* which describe his hypothesis on how a precise knowledge of post-veraison heat loads can be used to index varieties to their optimal thermal environment from a flavor/aroma standpoint.

Happ will give two presentations at the symposium: One will be a discussion and critique of several climate indices that are currently used to predict grape and wine quality. The second will involve application of the heat load index to specific vineyard sites.

American Society for Enology & Viticulture
EASTERN SECTION
2004 Annual Technical Meeting and Symposium
14–16 July 2004
ROANOKE, VIRGINIA

Grapes, Wine and Environment:
How soils, cultural practices and warm climates affect wine quality

Hotel Roanoke and Conference Center (www.hotelroanoke.com/), a short drive from spectacular scenery, the Blue Ridge Parkway, and some of Virginia's finest wineries.

INCLUDING:
- **Pre-conference tour of southwestern Virginia wineries: see and discuss local adaptations to environment**
- **technical presentations**
- **a Viticulture Consortium: East research summit**
- **wine industry trade show & wine receptions**
- **student paper competition**
- **annual business meeting, and banquet**

The underlying goal of the symposium is to explore how soils, climate (particularly temperature), and cultural practices affect fruit and wine composition and quality, especially in a warm, humid environment.

KEYNOTE SPEAKERS INCLUDE:
- **KEES VAN LEEUWEN, winemaker of Cheval Blanc (Bordeaux)**
- **ERLAND HAPP, winemaker at Happs and Three Hills Winery, Western Australia**
- **DANIEL GRANES, research director, ICV, Narbonne, France**

Additionally, current research on vine nitrogen nutrition, including wine issues, and on canopy and crop management practices appropriate for less-than-ideal winegrowing climates will be presented. Coming on the heels of the supremely challenging 2003 season, all of these issues are timely and germane to winegrowers throughout the Eastern Section.

Visit the ASEV/ES website
(www.nysaes.cornell.edu/fst/asev/)
to obtain further details

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"Paul Dolan has not only led the way to sustainability in California viticulture but has demonstrated that one person in one company can transform an entire industry."

— PAUL HAWKEN, Author, *The Ecology of Commerce*

Order from ***PWV* Bookshelf**, page 53
200 pages — $27.95

A description of the heat load index Happ proposes will be included. The index is based on hour-degrees greater than 22°C (72°F), measured every 20 minutes. Since aroma/flavor and phenolic compounds begin accumulating in grape berries about three to four weeks before harvest, heat load indexing is calculated for the final 28 days of fruit maturation.

Temperature can be regarded as an important environmental condition because of its effect on plant enzyme systems regulating the accumulation of aroma/flavor. Because the changes in the dynamics of aroma/flavor and phenol production are not the same at 22° to 23°C compared to 31° to 32°, Happ's system takes into account such temperature variation, which is important for production and conservation of secondary plant metabolites such as aroma and flavor.

In addition to climate, hang time is another important issue impacting grape and wine quality. Research conducted by the Wine-Enology-Grape Chemistry Group at Virginia Tech suggests that the shorter the season (time from flower bloom to grape harvest) generally, the higher the total fruit glycoside concentration (in part, aroma/flavor precursors), and the higher the resultant wine quality.

Grape color, for example, increases throughout ripening to a maximum level, when it then begins to gradually decline. The same appears to be true for some grape-derived aroma/flavor compounds. A general topic of discussion at the symposium will be the relationships between hang time and fruit and wine quality.

Dr. Gregory Jones will make two presentations. Jones earned his bachelor's and doctoral degrees at the University of Virginia and is employed in the Department of Geography at Southern Oregon University. His research interests include climatology, meteorology, cartography, geographical information systems (GIS), and global climate change issues. Much of his research has had an underlying viticultural and/or enological theme, since he has family ties to commercial wine production in Oregon.

Jones' first presentation will provide an overview of global climate/wine quality relationships, with an analysis of how the general or synoptic climate of a region can impact wine quality. He will use Bordeaux as an example. His second presentation will show how local climate databases (such as PRISM spatial climate data) can be used to predict grapegrowing and winemaking potential.

A major thrust of the symposium will be towards defining an "optimal" grape and grapevine environment for quality wine production. Once the variety/environment match is made, we can further adjust this relationship to improve quality. Choice of rootstock, vine nutrition, irrigation, crop level, and other cultural practices influence final grape and wine quality.

Dr. Andrew Reynolds, research chair in viticulture at Brock University's (Ontario) Cool Climate Oenology and

Viticulture Institute, is a leading research authority on grapevine canopy management. He will review the goals and results of various canopy management practices, specifically for flavor, aroma, and color synthesis. He will compare and contrast results in cool and warm/hot grape production regions.

Canopy management is one of the most effective means of altering grape composition. The specific techniques used in canopy management should be tailored to the desired outcome, which is a function of the variety, and the environment in which the grapes are grown. The goals of canopy management in a hot climate may be different from those in a cool climate, and the goals for Cabernet Sauvignon may be different from those for more aromatic varieties.

Dr. Phil Freese (Healdsburg, CA) will address the potential for expressing fine wines from unique winegrowing sites. Following a trip to France in 1979 guided by legendary winemaker André Tchelistcheff, Freese returned to the U.S. convinced that fine wines are "grown," not "made." This early experience became the basis for the approach he uses at all the vineyards he is involved with.

Freese emphasizes controlled stress, moderate-sized vines, and low yields, combined with *terroir* and a respect for varietal characteristics, to produce wines of character, intensity, and longevity.

Freese, in partnership with his wife, winemaker Zelma Long, created Zelphi Wines with a mission to identify unique locations around the world for making site-specific wines of "exceptional breeding." In addition to owning Zelphi, Freese is the founder of WineGrow, an independent wine service that helps clients devise means of achieving style and quality through a combination of viticultural management and systems design.

Freese will discuss improving red wine mouthfeel in the vineyard. Based on his experience and the scientific literature, he has noted that water deficit after flowering leads to the largest reduction in berry weight, an increase in anthocyanins, and total soluble phenolics. It is clear that only ripe vines make the ripe fruit needed for appealing mouthfeel, and that seeds and shoots must be ripe.

Ripe vines have a certain look: the shoots appear woody and there is no loss of basal leaves, which help to protect the fruit from too much sun while also limiting entry of potassium. Ripe vines have fruit with brown seeds, which easily separate from the pulp.

Several presenters will discuss wine technology, including mouthfeel issues. Daniel Granes, research director for the ICV, Narbonne, France, will discuss methods of conducting alcoholic fermentations, and oak management to develop grape potential in warm climates.

Bruce Zoecklein (Virginia state enologist) will discuss the use of delestage and seed deportation as a fermentation management tool. Tony Wolf (Virginia state viticulturist) will present research on training systems and fruit composition.

These and other presenters will address wine industry topics in the symposium. In addition, there will be numerous sensory evaluations. A trade show will include more than 30 exhibitors. A gala dinner will be held in the Hotel Roanoke's Regency Dining Room, which has been restored to provide a southern hospitality atmosphere, featuring regional cuisine. The Regency Dining Room has won an award from Distinguished Restaurants of North America, was selected as the Best Restaurant by the *Roanoker Magazine*, and received a *Wine Spectator* award. ■

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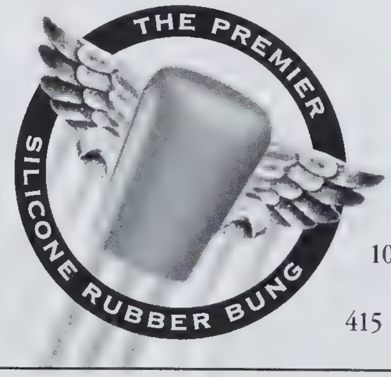

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55TH ANNUAL MEETING

ASEV to honor Peter Christensen, Hildegarde Heymann

Over 60 years of scientific investigation and expertise will be recognized at the American Society of Enology & Viticulture's (ASEV) 55th Annual Meeting in San Diego, CA, June 30–July 2, when the society bestows its highest honors on veteran researchers L. Peter Christensen (Merit Award Winner) and Hildegarde Heymann (Honorary Research Lecturer).

Christensen and Heymann are two of the wine industry's most respected and acclaimed researchers. ASEV is dedicating additional resources to ensure that their presentations are supported by a program that links scientific innovations directly to the demands of the wine marketplace.

"Pete Christensen's contributions to the wine industry are many and far reaching," says Bill Nakata, chair of the Awards Committee. "Pete had the vision and energy to begin research that we're still working on today and will continue to work on for years to come. In addition, he trained numerous students who went on to do great things in our industry and serve the society."

Christensen, born and raised on a raisin farm in Selma, CA, had a 40-year career with the University of California Cooperative Extension before retiring in 1999. Considered by many in viticulture to be the field's premier scientist on grapevine mineral nutrition, Christensen published more than 200 reports, articles, and abstracts over the course of his career, twice receiving the Best Paper in Viticulture Award from the ASEV.

He also served as president of the society from 1990–1991 and was its Honorary Research Lecturer in 1998. In 1997, Christensen was presented the James H. Meyer Distinguished Achievement Award, one of the most prestigious awards conferred by the Univeristy of California, Davis, in recognition of his exceptional career achievements.

Sensory scientist Hildegarde Heymann earned both her M.S. in food science (enology) and her Ph.D. in agricultural and environmental chemistry at UC Davis, where she is now a professor in the Department of Viticulture & Enology. During her 24-year career, Dr. Heymann has produced 60 publications and is the coauthor (with Larry T. Lawless from Cornell University) of the sensory textbook *Sensory Evaluation of Foods: Principles and Practices*, currently the most assigned sensory textbook worldwide.

In 2000, she received the Faculty Alumni Award from the University of Missouri Alumni Association; in 1993, the Gold Chalk Award for Excellence in Graduate Teaching from the Graduate Professional Council; and in 1991 and 1993, the Food Science Association awarded her the honor of "Professor of the Year."

"I am flattered and honored to have been selected from among so many deserving candidates," says Heymann. "The Society has presented me with many opportunities throughout my career, especially early on. My first opportunity to speak and present my work was at the society's annual meeting. To be invited back and have the opportunity to discuss the broader aspects of sensory evaluation is very gratifying."

Christensen and Dr. Heymann will speak at the annual meeting, which will also feature a variety of presentations offering the latest in research in enology and viticulture from around the world. The meeting will include a trade show and an all-day session focusing on *Brettanomyces* on Friday, July 2. The annual meeting will be proceeded by a Soil, Environment and Vine Mineral Nutrition Symposium, June 29–30.

For more information about the ASEV Annual Meeting, please contact the American Society for Enology & Viticulture at 530/753-3142, by e-mail at society@asev.org, or visit the website at www.asev.org. ■

Soil, Environment, & Vine Mineral Nutrition Symposium

TUESDAY, JUNE 29
TECHNICAL REVIEW

Overview: Effects of soil physical and chemical characteristics on soil mineral nutrient availability, movement and uptake, **Alfred Cass**, *Alfred Cass & Associates, Santa Rosa, CA*

Soil acidity and impact on fertility, **Malcolm Sumner**, *University of Georgia, Athens*

Adverse soil chemistry and impact on vine nutrition — salinity and sodicity, and impact of rootstocks, **Rob Stevens**, *South Australian Research and Development Institute, Australia*

Microbial ecology of vineyard soils, **Kate Scow**, *University of California, Davis*

Mycorrhizae and NPK acquisition, **Paul Schreiner**, *Oregon State University, Corvallis*

Soil Analysis — What you need to know about labs, procedures, and results, **Robert Miller**, *Colorado State University, Ft. Collins*

Critical plant tissue values and application of nutritional standards for practical use, **Ben Robinson**, *Scholefield Robinson Horticultural Service, Australia*

Partitioning of mineral nutrients and fertilizer use efficiency (include timing of fertilizer application), **Kobus Conradie**, *ARC Infruitec, South Africa*

Foliar fertilization in vine nutrient management programs (both macro/-micro-nutrients), **Pete Christensen**, *University of California Kearney Agricultural Center, Parlier*

Rootstock and variety influences on vine nutrition, **Jim Wolpert**, *University of California, Davis*

Deficit irrigation protocols and the impact on vine nutrition, **Markus Keller**, *Washington State University, Prosser*

WEDNESDAY, JUNE 30
SOILS AND MINERAL NUTRITION FORUM

Acid soils, **Daniel Roberts**, *Integrated Winegrowing, Sebastopol, CA*

Serpentine and high magnesium soils, **Paul Anamosa**, *Crop Care Associates, Inc., Yountville, CA*

Lime and alkaline soils, **Neil Roberts**, *Robert Mondavi Winery, San Luis Obispo, CA*

Saline and sodic soils, **Ben Robinson**, *Scholefield Robinson Horticultural Service, Australia*

Fertigation practices and pitfalls, **Bill Peacock**, *University of California Cooperative Extension, Tulare*

Compost and organic matter additions, **Alfred Cass**, *Alfred Cass & Associates, Santa Rosa, CA*

Brettanomyces Symposium

FRIDAY, JULY 2
I. DIVERSITY OF *BRETTANOMYCES*

Genetic, **Thomas Henick-Kling**, *Cornell University, Geneva, NY*

Physiological, **Lucy Joseph**, *University of California, Davis*

Identification of *Brettanomyces*, **M. Malfeito-Ferreira**, *New University of Lisbon, Portugal*

Brettanomyces as viable non-culturable organisms in wine, **Trevor Phister**, *University of California, Davis*

The level of detection of 4-EP and 4-EG in spiked wines (tasting), **Thomas Henick-Kling**, and **Linda Bisson**, *University of California, Davis*

II. PRACTICAL IMPLICATIONS OF *BRETTANOMYCES* IN THE WINERY

Diversity of metabolites of *Brettanomyces*, **M. Malfeito-Ferreira**

Brettanomyces strain diversity in wines, **Ken Fugelsang**, *California State University, Fresno*

Brettanomyces impact characters (tasting), **Donald Wirz**, *University of California, Davis*

III. MANAGEMENT OF *BRETTANOMYCES*

Sources of *Brettanomyces* and the control in the winery, **Juerg Gafner**, *Swiss Federal Research Station, Switzerland*

Strategies for control of *Brettanomyces*, **Rich Morenzoni**, *Art of Winemaking, LLC*

Incidence and control of *Brettanomyces*: The Australian perspective, **Paul Henschke**, *Australian Wine Research Institute, Australia*

When is it spoilage? Matrix effects in the detection of Brett characters (tasting), **Leslie Norris**, *FlavorSense, CA*

Vine Selection and Clones

Continued from page 65

Second, fine wine production in California spans a wide variety of climatic regions, elevations, and soil types. For the major varieties — Chardonnay, Cabernet Sauvignon, Merlot, Zinfandel, Pinot Noir — multiple trials are needed to understand how clones will perform in different regions. In addition, the flood of new clonal material in California brings a continuing need for new sets of trials.

Finally, clonal evaluation involves three consecutive steps: viticultural analysis (growth and yield components, rot susceptibility), wine analysis (chemical data, color, tannin), and sensory evaluation. Each step builds on the previous one, but with increasing resource needs. Evaluating the great diversity of clonal material now available in California will require expanding current viticultural research programs and winemaking evaluations.

(The above excerpt is taken from the 188-page publication, *Wine Grape Varieties in California,* the first comprehensive variety publication written by University of California viticulture specialists and extension advisors to cover all California wine regions. This guide for growers and vintners includes ripening periods of varieties and growing districts for 55 varieties in California, a glossary, and a bibliography.

There is extensive information on 36 major wine grape varieties grown in California, including synonyms; source; physical characteristics, such as cluster, berries, and leaves; and winery use. There is information on: growth and soil adaptability, choice of rootstocks, clones, training and pruning, trellis and canopy management, plus insect and disease problems. Each variety is highlighted by close-up photography of its clusters, leaves, and leaf shoots; a total of 143 color photographs. Similar information is given for 12 minor black wine grape varieties and seven minor white grape varieties.)

Wine Grape Varieties in California, ANR publication 3419, ISBN 1-879906-63-5, is available for $30 from the *PWV* Bookshelf, page 53. ■

IN THE CELLAR

by Jake Lorenzo

'Cruising' with the magic card

"*Gracias, á Dios*," exclaims Chuy. "Look at that sunset. I've never seen anything quite like that, *amigo*."

Jake Lorenzo, private eye, and his friend Chuy Palacios sit in the highest of four hot tubs on the pool deck as the sun sinks slowly to its fiery finish for the day. In fact, they have most of the deck to themselves as the sky turns magenta and flames to crimson.

Jake pours another glass of the 1998 vintage Schramsberg sparkling wine into their glasses. Chuy raises his glass above the steaming bubbles coming from the tub. "To Jakelyn's mom, *carnal*, and to grand babies. If she wasn't up visiting the new one, your amigo Chuy wouldn't have made the cruise."

Jake Lorenzo had been hired to accompany a small group of winemakers on a Mexican cruise. Each of the four winemakers was giving a lecture and running a wine tasting. In the lingering aftermath of 9/11, Jake had been invited along as additional security.

Leaving Sonoma in the middle of a cold, rainy December for a sun-filled, 11-day cruise to Mexican ports made sense to Jake Lorenzo. The fact that Jake and one guest were on the cruise at no charge made everything much nicer. Of course, given the choice between a relaxing, warm cruise and a frigid visit to the new grand baby, Jakelyn's mother opted to freeze her keester off in Seattle.

It had been a long day. Chuy and Jake slicked their way through rush hour traffic to the Oakland Airport by shrewdly going in Jake's pick-up truck. (Trucks can use the diamond lane.) It saved a good hour. Still, the cattle call of airports, the hassle of shoe removal, and the crush of pre-Christmas travel can wear out an honest detective.

Getting on the ship was an exercise in disorganization and disorientation. Jake took one look at the chaos in the boarding area, went up to an official, and he and Chuy were politely escorted through the crowd onto the ship. "Have a good cruise, Mr. Lorenzo. Let us know if there is anything we can do for you." Security gets a lot of respect on board a ship these days.

Jake checked in with the cruise director, who welcomed him on board and handed him the "magic card." The "magic card" allowed Jake to purchase beverages on-board for 50% off the retail price. Not only does security get respect, it gets a magic card.

Chuy and Jake checked into a windowless dungeon of a cabin. They met Edy, their Filipino cabin steward, and unpacked their clothes. They grabbed the magic card and went in search of a bar. They got their half-price cocktails and reconnoitered the ship. They arranged to be in the late seating for dinner. They located the various bars and restaurants, and searched out the new sushi bar. They asked for and were given a copy of the dining room wine list, which they always carried with them.

The hard work done, they eased into the hot tub with the bottle of Schramsberg, which cost only $19. Then came the sunset as the ship pulled out from San Diego.

Cruise ships are not really Jake Lorenzo's cup of tea. They are floating bastions of 19th century colonialism. Lowest on the totem pole are the waitstaff, cabin stewards, and maintenance workers. Most are from poor countries like the Philippines, Croatia, Belarus, Jamaica, and the new Russian territories, and they don't make much money.

The cruise director and his staff are primarily from the U.S. and Europe, and receive reasonable pay. At the top of the chain are the captain and his officers. On this ship, they are all Greek.

All crew members sign on for contracts that run six to eight months. They get *no* days off for the duration of the contract. They are jammed three to a room into small cabins below decks. Whenever they are working on the ship, they are required to wear uniforms and to be incredibly polite and solicitous of the passengers, no matter how obnoxious or idiotic the passenger. There are 900 crew members to serve 2,000 passengers.

Their primary source of relaxation is the "Crew Bar," which is totally off-limits to all passengers (even cool private eyes from Sonoma). The crew bar serves up discounted drinks and only charges a 10% service charge. On occasion, the crew can get a few hours off when the ship is in port.

The guests are primarily from the U.S. On this cruise ship, they also tend to be elderly with an average age of 60 to 70. Most come from cold climates, have accents, and wear tons of gold and diamond jewelry. They expect good treatment, first class food and lots of it, and they like to dress up for dinner.

Colonialism does have some good points. Service on board the ship was impeccable. Edy changed towels in our cabin every time we used them, often two or three times a day. He always had fresh water and ice on our desk. The beds were made promptly in the morning and turned down efficiently every night with a chocolate truffle on the pillow. (Chuy really got into the truffles.) Every time you passed someone in the hall, they smiled and said, "Hello, how are you, sir?" Often they even remembered your name.

Restaurateurs and wineries should study dining service on board a cruise ship. In the dining areas the service was spectacular. The waiters and bus boys were efficient, friendly, and expert. Sommeliers were knowledgeable about the list, helpful with wine pairings, and thrilled when wine drinkers make themselves known.

The list itself was terrific. It leaned hard on French wines, but had a good representation of California and other countries. Prices were reasonable, cheaper than the same wines at most restaurants. A delicious Mount Redon Chateuneuf du Pape sold for $38 ($19 with the magic card). Three very decent German Spatleses could be had between $12 to $24 (pre-discount) and made perfect lunch companions. The

California section was dominated by Kobrand, but still allowed us to sample Benziger, Cakebread, and Domaine Carneros. Once the magic card was brought into the equation, prices became downright charming.

When Chuy and Jake boarded the ship, they brought along eight bottles of wine and a bottle of Centinela tequila. They drank all of that. After an 11-day cruise, the wine and liquor tab came to $424, and that's with the magic card 50% discount.

Jake Lorenzo thinks there is a real lesson to be learned here. Wineries should be giving their employees and growers magic cards. Now, Jake Lorenzo is a detective, and he knows that many wineries already give discounts to employees and growers, but in the frenzy of allocated sales and waiting lists, many of the discounts have shrunk to 30%. And discounted purchases were limited to sales at the winery.

With a real magic card, every time one of us went into *any* store or restaurant, we'd receive a 50% discount. This would be exciting, and it certainly wouldn't slow down total consumption. It would also enable a lot of employees to buy the wine that they help make, but can't afford to purchase given their current salaries. Wineries would simply reimburse for purchases charged to the card. Jake Lorenzo wouldn't be surprised if stores and restaurants participated in the discounting program. After all, right now almost everyone is hurting and "a depletion is still a depletion."

Think of it as a necessary perk for employees, sort of a medical plan for the spirit. In fact, if we were really together on this, we could multi-task the magic card. On the ship, your card also opens the door to your cabin. Maybe winery magic cards could be flashed for police, giving their bearers a .04 handicap on any sobriety tests they are given. ■

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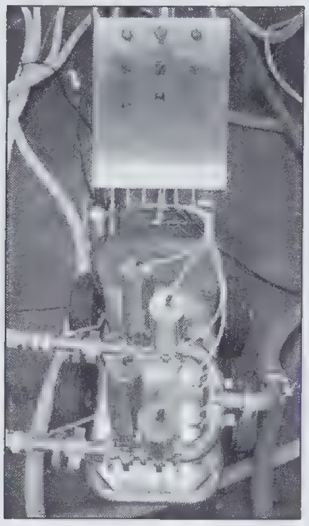

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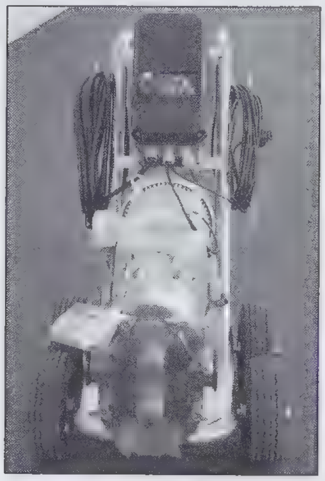

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SMART VITICULTURE *by Dr. Richard Smart*

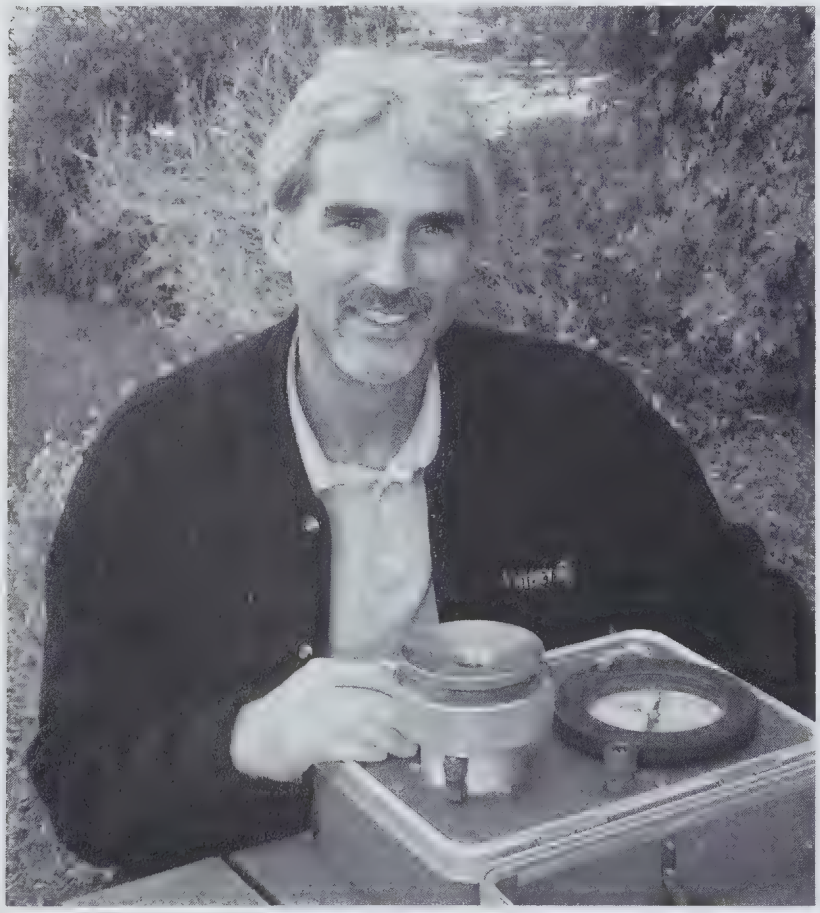
Successful irrigation in Monterey County

Ask anyone about vineyard irrigation around the Central Coast of California and you are sure to hear Steve McIntyre's name. His vineyard management company has a reputation for being very switched on with irrigation. I visited Steve in December of 2003 to discuss his irrigation philosophy.

Steve is a Fresno State University viticulture graduate who was fortunate to work with Professor Vince Petrucci for two years while completing a master's thesis. Steve's family hails from Ventura, CA, where they have large operations farming avocados. After graduation, Steve worked as an assistant winemaker before moving on to vineyard management, where he felt he could more directly impact wine quality.

Steve founded Monterey Pacific Vineyard Management Company in Soledad, CA, in 1992. The company began with operations on 435 acres, and now manages about 7,000 acres (100% in Monterey County). Its motto is "applied agricultural technology," which reflects the aim to stay at the cutting edge of viticultural technologies.

Professional staff are employed for multiple aspects of vineyard management, including pest and disease control. Irrigation, however, is a company speciality where the average annual rainfall is just over 10 inches. Currently, Steve schedules irrigation for about half of the managed acreage.



Steve McIntyre's company motto is "applied agricultural technology."

Steve's approach to irrigation is dynamic. Initially his emphasis was soil-based, but now it is plant-based. His early experiences were with neutron probes, then with the newer capacitance probes from Australia, with such brand names as "Enviroscan" and "C-probe."

Tensiometers for young vines

McIntyre finds the old-fashioned tensiometers still the best control for young vines, in the first and second leaf. His irrigation strategy is simple: keep the soil wet enough to maximize growth. Steve finds that newer designs of tensiometers are easier to maintain and have an extended range to 90 cbars. He uses one-foot and three-foot long tensiometers paired 12 inches apart in the vine row at least 12 to 18 inches from the vines, and aims to keep the tension at less than 40 cbars at three feet of soil depth. How many pairs of tensiometers depends on soil type and variability.

Irrigation of mature vines

Since 1997, Steve has used the pressure chamber to initiate irrigation, based on research by Larry Williams of University of California, Kearney Agricultural Center. Measurements are taken in the middle of the day (11 AM to 1:30 PM), using leaves bagged while on the vine which are sun-exposed for at least one hour prior to sampling. Each block is measured at the same time of day each week. Irrigation is initiated when vines hit about –12 bars for white grapes, and –12 to –14 bars for red grapes.

Steve and I discussed my reservations about the pressure chamber (See ***PWV*** November/December-2001) and the influence of day-to-day weather variation on the measurement. He agrees that there can be a temperature effect, which needs to be factored in, but not factored in an extreme day, just note that the vines might be "stressed" one day but recover quickly once the fog rolls in. He also has problems with once-daily sampling, compared to continuous measurement now available with some other systems. There are several new systems becoming available for sap flow measurements, trunk diameter, etc., that will employ data loggers for continuous measurement.

A current project is to evaluate a device whereby a probe is inserted into a petiole xylem (water-conducting tissue) to measure petiole water content and/or proton flux. He is making comparisons with a pressure chamber in the context of soil moisture variation, and is hoping to develop a "stress index" allowing for vine stress and soil moisture availability.

Vine appearance is also closely monitored, including shoot-tip growth, tendril erectness, and leaf angle. Though these appear to correlate with pressure chamber readings, these have not been quantified. An index or matrix could be developed to consider multiple factors, such as variety, rootstock, weather, canopy, measured crop load, plant water status, and soil moisture reservoir to facilitate irrigation decisions.

Viticulture and winemaking issues also need to be considered along with the issues of plant physiology and soil physics when irrigating. He finds that grape varieties vary in their drought tolerance. Grenache, for example, is very tolerant of water stress. A major consideration is, of course, the projected end value of the wine, which affects desired yield and levels of stress.

Soil depth also plays a major role, with shallow soils requiring more frequent irrigation. Steve also finds that young vineyards are more prone to water stress than are older ones — no doubt a reflection of their limited root system.

Application amounts

Steve bases irrigation amounts on Professor Larry Williams' studies of vineyard evapotranspiration. He finds that it is easy to calculate crop factors, which depend on vine spacing and trellis. Local measurements of evapotranspiration are used from the CIMIS network.

Stress levels

About three weeks prior to veraison, the vines are put into mild moisture deficit, which is sufficient to stop vegetative growth. Steve then provides adequate water to limit stress severity and to maintain leaf health and function. This is exactly the advice I give to my clients.

Other water matters

Steve has no fixed ideas about the current partial rootzone drying (PRD) debate. He reasons that alternating irrigation using drip systems affects only a small proportion of the root system anyway, which may explain unpredictability of results.

Steve is also investigating use of drip emitters buried at the four-foot depth, which he finds an interesting method to manage salt problems.

New developments with colleague Doug Beck include using GIS, infrared imagery, and yield monitors on mechanical harvesters to look at vineyard variability. Infrared aerial photos are spectrally-enhanced to create an NDVI (normalized difference vegetation index) to enable visualization of high- and low-vigor areas within blocks. Vine and grape parameter sampling can then be accurately targeted to cover block variation. Steve also uses pre-plant soil mapping as a means to minimize variability.

Conclusion

I think Steve McIntyre's reputation as "irrigation master" is well-earned. He is certainly aware of new developments and is right up there in evaluating the latest technology. Congratulations to Steve and his team for realizing that irrigation control is one of the most valuable tools we have at our disposal to determine wine quality in the vineyard, while also having a significant effect on yield and vigor. ■

Dr. Richard Smart, "the flying vine-doctor," is an international viticultural consultant based in Launceston, Tasmania, in Australia. He can be contacted by e-mail: vinedoctor@compuserve.com. Read about Dr. Smart's business, including his consulting schedule, educational wine tours, and seminars, at his home page http://www.smartvit.com.au. He visits America frequently, and his consulting schedule is arranged by Vinquiry in Windsor, CA, tel: 707/ 838-6312 and http://www.vinquiry.com.

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Soils and wine grapes

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important effects on vine leaf area and cluster and berry development.[4]

Soil vigor potential

The concept of soil vigor potential was developed by Terra Spāse to quantitatively describe the combined effects of up to 20 different physical and chemical attributes of soil, and their effect on vine growth, water status, and production parameters. Soil vigor-potential data can be used to help in the selection of block layout, rootstocks, vineyard spacing, and trellis configuration, irrigation system design, and application of pre-plant soil amendments.

On high vigor-potential soils, until recently, it has been the practice in the Napa Valley AVA to increase vine spacing and tractor row width, select high to moderate vigor rootstocks, and utilize a divided canopy trellis system with drip irrigation. However, this approach has fallen out of favor, and growers are trying new ways to deal with high vigor-potential soils.

Summary

The soils of the Napa Valley AVA are diverse in their origin, extent, and influence on the grapes grown there. With 33 soil series and six of the 12 soil orders present, significant differences in the production and quality of Napa grapes should be expected.

The soils series in the Napa Valley AVA differ with regard to their parent material, age, topography, climate, and biology. From the deep alluvial soils of the valley floor to the shallow rocky upland soils derived from volcanic and sedimentary parent materials, the soil series of the Napa Valley AVA have direct effects on vine root growth, water uptake, and vine nutrition.

Information in this report establishes a scientific basis for understanding the diversity of soils that occur within the Napa Valley AVA. Significant evidence, both analytical and empirical, exists to establish strong links between that diversity and the range and quality of the region's grape varieties.

Soils and Wine Grapes in the Napa Valley AVA has 233 pages and 137 color maps and images. It is available from: Terra Spāse, Inc., 345 La Fata St. Suite D, St. Helena, CA 94574, tel: 707-967-8325, fax: 707-967-8596, email: terraspase@earthlink.net, web: www.terraspase.com.

References

1. Coombs, B.G., and P.R. Dry, editors. 1988. *Viticulture. Volume I. Resources*. Winetitles. Adelaide, South Australia.

2. Johnson, H., and J. Robinson, 2001. *The World Atlas of Wine*. Octopus Publishing Group LTD.2-4 Heron Quays, London.

3. NRCS Soil Survey. 1977. *The Soil Survey of Napa County, California*. U.S. Dept. of Agriculture.

4. Skinner, P.W., and M.A. Matthews, 1990. "A novel interaction of magnesium translocation with the supply of phosphorus to roots of grapevine (*Vitis vinifera* L.)." *Plant, Cell and Environment*, 13:821-826.

5. Wilson, J.E. 1998. *Terroir. The Role of Geology, Climate, and Culture in the Making of French Wines*. Univ. of California Press. Berkeley and Los Angeles, CA.

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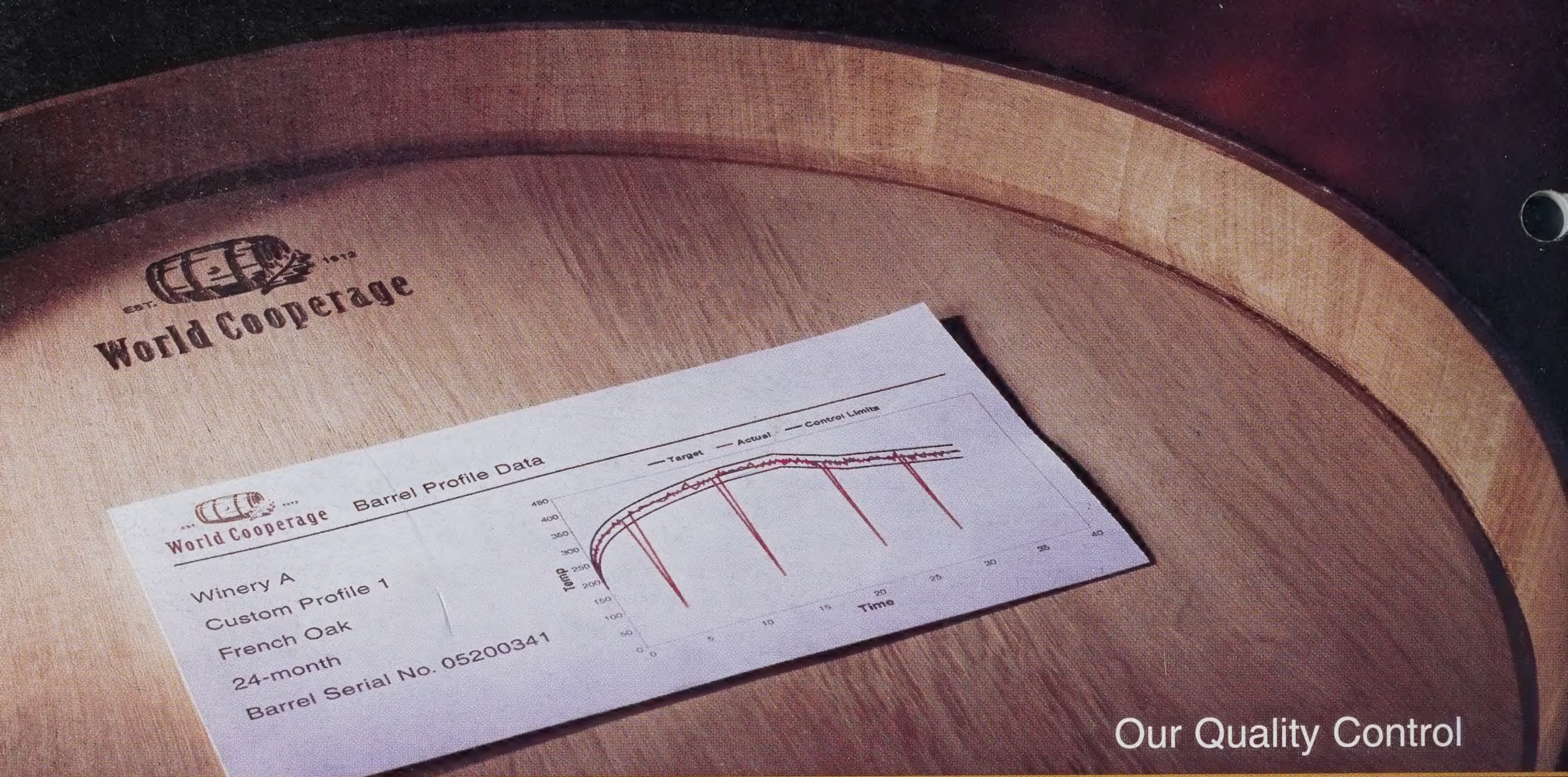

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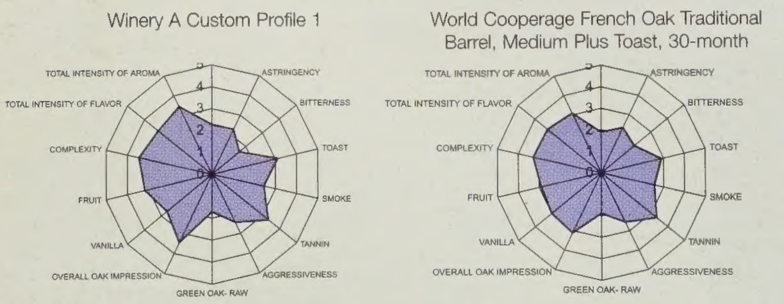
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